Independent Environmental Audit

Genesis Landfill and Recycling Centre

59915176

Prepared for
Dial a Dump Industries Pty Ltd

21 August 2015

Privileged and Confidential

Cardno
Shaping the Future

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Document History

Version	Effective Date	Description of Revision	Prepared by:	Reviewed by:
V1	22/7/2015	Original document	Jolyon Peart	Hugh Selby
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Rev0	21/08/2015	Issued as final	Jolyon Peart	Hugh Selby

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Abbreviations

BCC	Blacktown City Council
Cardno	Cardno (NSW/ACT) Pty Ltd
C&D	Construction and Demolition
DIPNR	Department of Infrastructure Planning and Natural Resources
DLWC	Department of Land and Water Conservation
EPA	Environment Protection Authority
EPL	Environment Protection Licence
NSW DP&E	NSW Department of Planning and Environment
mBGS	Metres Below Ground Surface
QA	Quality Assurance
QC	Quality Control

Units

m^2	Metres Squared

1 Introduction

1.1 Background

Cardno (NSW/ACT) Pty Ltd ("Cardno") was engaged by Dial a Dump Industries – 'DADI' ('the Client') to undertake an Independent Environmental Audit ("the audit") of the Genesis Landfill and Recycling Centre, Honeycomb Drive, Eastern Creek, NSW (herein referred to as 'the project' and 'the site').

The site occupies:

> Lot 1 DP1145808; and

> Lot 4 DP1145808.

The project receives non putrescible waste (principally Construction and Demolition - CD waste) consisting of concrete, brick, tile, plasterboard, asbestos fibre cement and timber. The project also receives non-putrescible mixed waste containing plastic and cardboard. Incoming waste streams are separated and processed into products for sale and off-site re-use. Non recyclables such as asbestos and inseparable waste mixtures are disposed of on-site via landfilling within a former quarry void.

The project operates under Environmental Protection Licences (EPLs) 13426 and 20121 and pursuant to project approval 06_0139.

The Audit Report was prepared in accordance with the scope presented in Cardno's proposal dated 29 April 2015.

1.2 Purpose and Objectives

This Independent Environmental Audit has been undertaken for the purpose of evaluating the environmental performance of the project, and specifically, for fulfilling Condition 7, Schedule 5 of the project consent 06_0139 (as modified). Condition 7 reads:

Within 6 months of the commencement of operation, and every 2 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:

a) be conducted by suitably qualified, experienced and independent team of experts (including an odour expert), whose appointment has been endorsed by the Director-General;

b) include consultation with the relevant agencies;

c) include a full odour audit of the project, taking into consideration the relevant technical guidelines and any odour complaints made since the previous audit;

d) assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL (including any assessment, plan or program required under these approvals);

e) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate;

f) recommend measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under these approvals.

1.3 Audit Details

Key details pertaining to the audit are summarised in **Table 1-2**.

Table 1-1 Audit Details

Item	Details
Audit Team	Lead Auditor – Jolyon Peart (Cardno)
	Auditor - Kester Boardman (Cardno)

Item	Details
	Audit Assistant – Steven Drysdale (Cardno) Technical Experts (Odour) – Michael Assal, Terry Schultz (The Odour Unit)
Audit Team Contact Details	C/O Cardno NSW ACT Pty Ltd Level 9 The Forum, 203 Pacific Highway St Leonards NSW 2065
Auditee	Alicia Marix-Evans (Dial a Dump Industries) Rodney Johnson (Dial a Dump Industries)
Auditee Contact Details	C/O Dial a Dump Industries 32 Burrows Road Alexandria NSW 2015
Audit Location	Genesis Landfill and Recycling Facility Honeycomb Drive Eastern Creek NSW 2766
Timeframe covered by the audit (the "audit timeframe")	19th March 2012 - 10th June 2015

1.4 Audit Program

The timing of key activities undertaken during this audit are summarised in **Table 1-2**.

Table 1-2 Audit Program

Task / Activity	Date
Review plans, procedures, develop audit criteria	19 May to 10 June 2015
Engage in agency consultation, seek and receive DP&E endorsement of the audit team	14 May to 28 June 2015
Site familiarisation visit	2 June 2015
Audit site visit	10 June 2015
Audit de-brief meeting	10 July 2015
Draft report prepared	26 June 2015
Final report issued	21 August 2015

1.5 Structure of this Report

The structure of this report is as follows:

> **Section 1** – introduction;

> **Section 2 –** describes the scope and methodology employed;

> **Section 3 –** details the audit findings;

> **Section 4 –** conclusions and recommendations; and

> **Section 5 –** references.

1.6 Limitations

This audit has been carried out in general accordance with ISO 19011:2011 Guidelines for auditing management systems.

The agreed scope of this audit has been tailored for the current purposes of the Client. The audit may not identify non-compliances or non-conformances in all areas of the site, or occurring after the audit was

conducted. The audit considered those plans, policies and procedures that were current at the time the audit was undertaken. These are listed in the document titled 59915176 Genesis Audit Document Register **(Appendix A)**

This Document has been provided by Cardno subject to the following limitations:

> This Document has been prepared for the particular purpose outlined in Cardno's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.

> The scope and the period of Cardno's services are as described in Cardno's proposal, and are subject to restrictions and limitations. Cardno did not perform a complete assessment of the project's compliance with respect to all possible statutory or regulatory obligations that may exist. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Cardno in regards to it.

> Conditions may exist which were not detectable from the limited quantity of evidence that could be reviewed on the day of the audit.

> It is recognised that the passage of time affects the information and assessment provided in this Document. Cardno's opinions are based upon information that existed at the time the audit was undertaken (10th June 2015).

> It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes to infrastructure, policies, procedures or management systems affecting the site, or its surroundings, or any laws or regulations.

> Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Cardno for incomplete or inaccurate data supplied by others.

> Cardno may have retained sub consultants affiliated with Cardno to provide services for the benefit of Cardno. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, Cardno's affiliated companies, and their employees, officers and directors.

2 Scope and Methodology

2.1 Scope

The audit scope been designed to align with the goals, objectives and statutory triggers of the audit. These are defined in the project consent, which in turn references other applicable plans, procedures and licences. The scope also includes areas of interest identified by regulatory agencies in the course of agency consultation undertaken in October - November 2012 and May - June 2015.

Accordingly, the scope if the audit incorporates an assessment of three key areas:

> General Environmental Performance;

> Odour Performance;

> The status and utility of Management Plans and procedures.

2.1.1 General Environmental Performance

The scope includes the following:

> An assessment of the degree to which the project is compliant with regulatory obligations contained within:

  - The project consent (06_0139 - as modified), dated 22 November 2009 and specifically Schedule 3 Specific Environmental Conditions;
  - Environment Protection Licence (EPL) 20121;
  - EPL 13426; and
  - The Light Horse Business Centre Volume 1: Environmental Assessment Report (ERM 2008), Draft Statement of Commitments.

> An assessment of the degree to which the project is conformant with commitments made within relevant Management Plans, procedures and assessments;

> An assessment of whether the project has addressed and resolved the concerns of the regulator and other agency stakeholders, which were raised during the 2012 consultation period;

2.1.2 Odour Performance

The scope includes:

> An assessment of the odour emissions of the project including a full and independent odour audit;

> A review of potential sources of odour;

> A review of the odour complaints made since the previous audit.

2.1.3 Management Plans and Procedures

The scope includes:

> An assessment of whether key management plans, procedures and assessments required under the project approval:

  - Have been developed;
  - Are current; and
  - Are fit for their intended purpose.

The Management Plans, procedures and assessments considered by this audit are the:

> Aboriginal Heritage Management Plan;

> Air Quality, Odour And Greenhouse Gas Management Plan;

> Amenity Berms Management Plan;
> Asbestos Handling Procedure - Eastern Creek;
> Emergency Evacuation Management Plan;
> Fencing And Security Management Plan;
> Green Waste Management Plan;
> Groundwater Monitoring Plan;
> Combined Landscape and Vegetation Management Plan;
> Noise Monitoring Program;
> Oil Spill Clean Up Procedure;
> Pests, Vermin And Weeds Management Plan;
> Pollution Incident Response Management Plan;
> Site Surface Water Management Plan; and
> Soil, Water and Leachate Management Plan.

2.2 Audit Criteria

Audit criteria were derived from applicable EPLs, the project consent, the project Environmental Assessment, applicable Management Plans, assessments / reports and from consultation with agency stakeholders.

In total, Cardno assessed the project's compliance / conformance status with respect to:

> 21 criteria derived from EPL 20121;
> 18 criteria derived from EPL 13426;
> 16 criteria derived from the project consent (06_0139);
> 10 criteria derived from the Light Horse Business Centre Volume 1: Environmental Assessment Report (ERM 2008), Draft Statement Of Commitments;
> 29 criteria derived from applicable Environmental Management Plans;
> Four criteria derived from applicable assessments and reports; and
> Three criteria derived from agency consultation.

In total, this audit assessed compliance / conformance for 101 criteria.

Audit criteria, their source and the project's compliance / conformance status are summarised in the 'Audit Findings and Recommendations' worksheet, presented as **Appendix B**.

2.3 Odour Audit

Consistent with Condition 7, Schedule 5 of the project consent Cardno carried out an odour audit as a sub-component of the broader *Independent Environmental Audit*. The odour audit utilised a range of information to derive conclusions regarding the compliance status of the project with respect to odour, including:

a) The findings of an odour assessment undertaken by The Odour Unit Pty Ltd on the 10th of June 2015 **(Appendix D)**;
b) A review of the project's odour complaints history; and
c) The findings of an odour assessment undertaken to support the project approval (Holmes Air Sciences, 2008).

Additionally, the odour audit assesses the adequacy of the existing Air Quality Odour and Greenhouse Gas Management Plan (LHBC, 2011).

The project's regulatory conditions pertaining to odour include:

> Condition L6 of EPL 20121/13426: “No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997”.

  Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises ….”

> Condition 30 of the project consent (06_0139): “The proponent shall not cause or permit the emission of offensive odours from the site, as defined under Section 129 of the POEO Act”.

2.4 Information Collection

The following tasks were undertaken for the purpose of collecting and evaluating information and evidence relating to the environmental performance of the project:

> Consultation with agencies and stakeholders including:
  - The NSW Environment Protection Authority (NSW EPA);
  - The NSW Department Of Planning and Environment (NSW DP&E);
  - Blacktown City Council (Blacktown City);

> Review of background documents, assessments and previous audit reports pertaining to the project; and

> A site walk-over to familiarise the audit team with the site and processes.

Evidence used to inform audit findings was obtained from the following sources:

> Documentary evidence (reports, data, procedures, inductions, training records etc) provided by the auditee;

> Interviews with site management and employees; and

> Observations made by the audit team during a site inspection on the 10th of June 2015.

2.5 Audit Process

A staged approach was employed for the evaluation of compliance or conformance in the course of this audit. The process is as follows:

1) Presentation of the auditee with the audit criteria in the form of statements, which elicit a response with respect to the auditee’s assessment of compliance or conformance status;
2) In the event the auditee responds to the effect the project is not in compliance / conformance with respect to that criterion, this is noted and no further investigation is undertaken with regards to this criterion;
3) In the event the auditee contends the project is compliant or conformant in regards to the criterion, this assertion is tested through the acquisition and evaluation of documentary evidence and/or an inspection of actual processes, infrastructure, plant and equipment; and
4) The auditor reaches a conclusion as to the compliance / conformance status on the basis of the information available, and his or her professional judgement.

In the case of multi-faceted criteria this audit seeks to make judgement with regards to whether the criterion was ‘substantially’ satisfied; that is over half of the sub-components were satisfied.

2.6 Consultation

Consultation was undertaken with stakeholder agencies and organisations in the course of the 2012 audit. In the course of the 2012 consultation, written correspondence was entered into with relevant agencies including the NSW DP&E, the NSW EPA, Blacktown City, Sydney Water and NSW Fire and Rescue. Agencies were invited to put forward issues of concern such that these could be considered in the audit scope.

In the course of planning this audit, Cardno engaged in consultation with NSW DP&E, the NSW EPA and BCC to garner their views in relation to odour, given that odour was not assessed during the 2012 audit.

Correspondence received in response to this consultation is presented within **Appendix C**. Formal correspondence was not received from BCC.

2.7 Terminology

Throughout this report reference is made to both ‘compliance’ and ‘conformance’. Compliance is a term used in relation to legal or regulatory requirements or obligations. Conformance is a term used in relation to internal systems, such as Management Plans, procedures of work instructions.

3 Audit Findings

3.1 Environmental Performance

Table 3-1 summarises the project's compliance / conformance status with respect to each of the six sources of regulatory obligations.

Table 3-1 Environmental Performance Summary

Source of Criteria	Compliance / Conformance Status
Environment Protection Licences	The project was compliant with 20 out of a total of 21 criteria derived from EPL 20121 (95% compliance). The project was compliant with 16 out of a total of 18 criteria derived from EPL 13426 (88% compliance).
Project Consent	The project was compliant with 15 out of a total of 16 criteria (94% compliance).
Environmental Assessment (ERM, 2008) Statement of Commitments	The project was conformant with nine out of a total of 10 criteria (90% compliance).
Management Plans	The project was conformant with 21 out of a total of 29 criteria (72% conformance).
Assessments and Reports	The project was conformant with three out of a total of four criteria (75% conformance).
Agency Consultation	The project was compliant with three out of a total of three criteria (100% compliance).

A detailed description of the compliance and conformance status with respect to each criterion is provided as **Appendix B**.

3.2 Odour Performance

3.2.1 Odour Audit

An odour survey was undertaken on the 10th of June 2015 in conjunction with the broader environmental audit. The scope, methodology and findings of the survey are presented within the report titled 'Genesis Zero Waste Facility Field Ambient Odour Assessment and Review Study' prepared by The Odour Unit in July 2015. The overall odour survey findings presented in the report indicate that minimal adverse odour was detected beyond the site boundary at the time of the assessment. The report notes however, that there were instances during the odour survey where odour from the site was detectable within the immediate vicinity of the site boundary i.e. along Kangaroo Avenue, however, this odour was not detectable further downwind from the site. In addition, the survey noted other local sources of odour, including an asphalt plant.

The odour survey report is appended to this audit report as **Appendix D**.

3.2.2 Odour Complaints History

Cardno undertook a review of the odour complaints received during the audit timeframe (7th December 2012 to 10th June 2015). With respect to odour complaints, Cardno reviewed the following information:

> The Genesis Facility, Eastern Creek Complaints Register (available at http://www.dadi.com.au/assets/Genesis%20Complaints%20Register%20Published.pdf and accessed 22 July 2015);

> Background information pertaining to specific odour complaints (dated January, February and April 2013, July 2014).

Review of the odour complaints history for the Genesis facility indicates three odour related complaints were lodged during the audit timeframe. These complaints were investigated and two of the three were deemed by site management to be unsubstantiated. The third (from 18/2/2013) was determined following investigation, to be caused by constituents of the leachate reacting with materials within the Sydney Water sewerage

network to generate odourous gas. This odourous gas was subsequently vented through the sewer vent pipes, leading to odour impacts in the community. Review of follow up-correspondence in relation to this latter incident suggests the issue was rectified by changes to the leachate treatment process.

Odour related complaints received in during the audit timeframe are summarised in Table 3-2.

Table 3-2 Odour Complaints, Genesis facility (December 2012 through June 2015)

Date	Complaint Summary
02/07/2014	After hours call to EPA@ 22h00 advising of pungent smell like rotting food coming across the landfill site in Eastern Creek. The wind direction is South Easterly and caller alleged it appears to be coming from Dial-A-Dump.
11-12/04/2013	Local residents complain of a 'chemical-like' / 'garbage-like' odour in the St Clair and Erskine Park area on evening of 9 April 2013. EPA contacted a number of facilities to ascertain cause.
18/2/2013	A Minchinbury Resident advised they had noticed an odour from Sydney Water sewer vent pipes following a heavy rain event and had been advised that it may be sewage from Genesis.

In summary, the Genesis facility has received three odour related complaints during the audit timeframe. The cause of one of the complaints was rectified through changes to the processes and procedures at the facility. Whilst it is not possible to definitively evaluate the legitimacy of the other two complaints, Cardno notes that the frequency of complaints is relatively low (three in two years), and on this basis, odour impacts upon nearby receptors appear infrequent.

3.2.3 Previous Odour Assessments

One odour assessment exists for the site, titled Air Quality – Odour and Dust: Light Horse Business Centre Development Application and prepared by ERM in April 2008.

A peer review of the assessment was undertaken by The Odour Unit as part of this odour audit. The review notes that the odour assessment appears to have been undertaken in accordance with the relevant technical guidelines set by the New South Wales Environment Protection Authority (NSW EPA) at the time that the assessment was being undertaken.

Additionally, the review noted that the dispersion model used is considered appropriate given the complex topography and meteorological conditions prevailing at the Facility location. In addition, the selection of a ground level odour criterion (glc) of 2 odour units (ou) for the modelling is conservative and considered appropriate given the close proximity of the existing, densely populated, urban residential area, north and west of the Facility.

Notwithstanding minor technical differences of opinion, the review concluded that the reviewer is satisfied with the approach taken by the assessment, and the methodology employed.

3.3 Management Plans - Efficacy of Strategies, Plans and Procedures

Cardno has undertaken a limited review of the general adequacy and efficacy of the project's environmental plans and procedures. In general, plans and procedures related to environmental management at the project were adequate for their intended purpose. It is noted that many plans reviewed in the course of this audit were prepared and approved during the consent stage of the project, and form part of a combined construction and operational phase EMP. Consequently, such plans place undue emphasis on construction phase risks, and many would therefore benefit from revision. The audit found that the operation did not exhibit a high degree of conformance with applicable management plans.

*Cardno notes that a number of the Management Plans reviewed in the course of this audit were revised in the period between the audit site visit (June 10th) and the time this audit report was prepared. The comments made in relation to the Plans **(Appendix E)** should be considered in the context of the review of plans and procedures currently being undertaken by Genesis management.*

4 Conclusions and Recommendations

4.1 Environmental Performance

In Cardno's opinion, the project displayed a high level of compliance with respect to regulatory conditions contained within applicable EPL's and the project consent. The project was deemed to be compliant with 92% of the EPL conditions assessed, 94% of the project consent conditions assessed and 90% of the commitments made by the Environmental Assessment.

Opportunities for improvement were identified with respect to Environmental Management Plans, procedures and other environmental assessments. Specifically, the project did not exhibit a high degree of conformance with the mitigation measures outlined in the Management Plans or the recommendations of other assessments. The conformance level with respect to Management Plans, procedures and other environmental assessments was 74%.

4.2 Odour Performance

Cardno has considered a number of lines of evidence in the course of the odour audit, including the findings of an in-field odour survey, a review of the project's odour complaints history, and the findings of a peer - review of the existing odour assessment for the project (ERM, 2008). Cardno is of the opinion that the current odour emissions of the project do not pose a meaningful risk to local receptors. We understand however, that odour emissions from landfills can change over time, and we therefore recommend periodic assessments of the odour impacts of the project and regular revisions of the Air Quality and Odour OEMP to reflect these changes.

4.3 Management Plans and Procedures

The Management Plans reviewed in the course of this audit were typically prepared a number of years ago (often during the project approval stage) and their applicability to the site as it currently operates could be improved. Site Management are cognisant of this issue and it is noted that a review of the existing management plans has been initiated.

4.4 Recommendations

In order to improve the environmental performance of the project, a number of specific recommendations are made in relation to this audit. These are detailed within the 'Audit Findings and Recommendations' worksheet, presented as **Appendix B**.

Key recommendations are:

> Undertake noise monitoring in accordance with regulatory requirements;

> Undertake landfill gas monitoring in accordance with regulatory requirements;

> Establish a procedure for the purpose of clarifying the project's obligations to externally report incidents;

> Undertake periodic Quality Assurance / Quality Control testing of the finished granular products to verify that fugitive asbestos is not present within the product(s);

> Initiate a pests, vermin and feral animal control program and a pests, vermin, feral animals and weeds monitoring program to inform the control program;

> Noting that a review of Management Plans is currently underway, ensure all Management Plans are updated in accordance with the specified frequencies, and that they are fit for purpose. Ensure revised Management Plans are consistent with EPA Guidance 'Draft Environmental Guidelines: Solid waste landfills' (Second edition, 2015).

5 References

Cardno (2012) Independent Environmental Compliance Audit For DADI Genesis Facility. Cardno, 19 March 20123.

ERM (2008) Air Quality – Odour And Dust: Light Horse Business Centre Development Application. Environmental Resources Management Australia, 4 April 2008.

TOU (2015) *Genesis Zero Waste Facility Field Ambient Odour Assessment and Review Study.* The Odour Unit, July 2015.

The Genesis Facility, Eastern Creek Complaints Register (available at http://www.dadi.com.au/assets/Genesis%20Complaints%20Register%20Published.pdf and accessed 22 July 2015)

Genesis Landfill and Recycling Centre

APPENDIX A

DOCUMENT REGISTER

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Independent Environmental Audit - Gensis Waste Facility
Project ID: 59915176
Date / Version: 21/7/15
Document Register

Origin	Document Name	Version / date	Cardno Copy 2015	Comments
EPL	Environmental Protection Licence 20121	05-June-2014	✓	
	Environmental Protection Licence 13426	11-October-2013	✓	
Approval Documents	Project Approval	22 November 2009	✓	
	Director General's Assessment Report for Project Approval	01-October-2009	×	
	Modification 1 Instrument	30-September-2010	✓	
	Director General's Assessment Report for Modification 1	30-September-2010	×	
	Modification 2 Instrument	09-November-2010	✓	
	Director General's Assessment Report for Modification 2	09-November-2010	✓	
	Modification 3 Instrument	05-December-2011	✓	
	Director General's Assessment Report for Modification 3	05-December-2011	✓	
	Voluntary Planning Agreement	11-April-2012	✓	Assumed to be undated MS word doc titled 'Light Horse Facility Planning Agreement'
	The Project Environmental Assessment titled Light Horse Business Centre dated December 2008, the associated response to issues raised in submissions, dated 6 April 2009 and Preferred Project Report dated 26 June 2009		✓	
	Modification application 06_0139 Mod 3 dated 10 May 2011 with supporting document titled Light Horse Business Centre, Environmental Assessment Report Modification 3, September 2011 prepared by Light Horse Business Centre (which contains 'Land Partners' operational landform plan, 'Martens' report for stormwater management. and building elevations);		✓	
EMS/CEMP	Environmental Management Strategy - Stage 1	March 2010	✓	
	Construction Environmental Management Plan - Stage 2A	2 October 2010	✓	
	Environmental Management Strategy - (Incorporating CEMP (Stage 2B) and OEMP	November 2011	✓	
Management Plans and Procedures	Aboriginal Heritage Management Plan	June 2011	✓	
	Emergency and Fire Response Plan (Emergency Evacuation Management Plan)	February 2011	✓	
	Traffic and Transport Code of Conduct (note superseded by TMP)	June 2011	✓	
	Traffic Management Plan		×	
	Green Waste Management Plan	June 2011	✓	
	Air Quality Odour AND GHG Management Plan	June 2011	✓	
	Asbestos Handling Procedure (Work Instruction)	No date specified	✓	
	Asbestos Removal and Hazardous Substances Work Instruction	January 2012	✓	
	Landscape and Vegetation Management Plan	June 2011	✓	
	Amenity Berms Management Plans	June 2011	✓	
	Fencing and Security Management Plan	June 2011	✓	
	Pest Vermin Feral Animals and Declared Noxious Weeds Management Plan	June 2011	✓	
	Conveyor and Chute System Maintenance and Management Plan		✓	
	Leachate Collection Conveyance and Management System	June 2011	✓	
	Soil Water and Leachate Management Plan	December 2011	✓	
	Groundwater Monitoring Plan	October 2012	✓	
	Site Surface Water Management Plan	November 2008	✓	
	Oil Spill Clean up Procedure Plan	No date specified	✓	
	Pollution Incident Response Management Plan	November 2012	✓	
	Green Waste Management Plan	June 2011	✓	
	Noise Monitoring Program	June 2011	✓	
Other	Air Quality - Odour and Dust,Light Horse Business Centre Development Application	4 April 2008		
	Noise Impact Assessment	August 2008	✓	
	Preliminary Contamination Assessment	April 2006	✓	
	Traffic Impact Assessment	April 2008	✓	
	Groundwater Assessment	August 2008	✓	
	Bushfire Hazard Assessment	July 2008	✓	
	Heritage Assessment	July 2005	✓	

Genesis Landfill and Recycling Centre

APPENDIX B

AUDIT FINDINGS AND RECOMMENDATIONS

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*C = Compliant NC = Non-Compliant N/A = Not Applicable

Item	Condition	Audit Criteria	Audit Methodology	Documentation Reviewed	Auditee Assertion	Auditors Observations / Notes	Auditors Conclusion	Recommendations
ENVIRONMENTAL PROTECTION LICENCE 20121 (RECYCLING / WASTE TRANSFER FACILITY, FORMALLY KNOWN AS THE MATERIALS PROCESSING FACILITY OR MPC)								
3: Limit Conditions								
1	L3.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table [EPL Page 9 of 26 - Wood waste, Garden waste, Building and demolition waste, Waste tyres, Soils meeting GSW].	Visual inspection Document review	Spotters Training Manual (May 2015). The Rejected Loads Register (undated). Incoming product testing register.	C	(a) The Audit team did not identify wastes other than those permitted on the site during the site inspection carried out on 10th June 2015. (b) Review of the spotters manual indicates systems are in place to identify and reject waste types that are not permitted. (c) incoming loads are tested regularly to ensure incoming materials are of suitable quality.	C	N/A
2	L3.2	No disposal or landfilling of waste may occur at the premises.	Visual inspection	N/A	C	The Auditor did not observe landfilling activities in the portion of the site subject to this EPL. Review of relevant procedures suggests the site is used for processing of waste prior to off-site disposal as beneficial products or landfilled in those parts of the site licenced for such purposes.	C	N/A
3	L 4.7	Noise monitoring must be conducted as per licence conditions with additional monitoring times to reflect the extended operating hours.	The Auditor accepts the Auditee's assertion.	Noise monitoring records / reports: Pacific Environment Ltd Genesis Waste Facility Pre-Sort Enclosure Noise Assessments 2013 (3 reports).	NC	Pacific Environment undertakes noise monitoring on the site. Reports sighted for 2013 and the Auditee indicates noise monitoring events have been commissioned for 2015. Monitoring was not been undertaken in accordance with required 6 monthly schedule in 2014.	NC	Undertake noise monitoring in accordance with regulatory requirements.
4: Operating Conditions								
5	O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Document review Interviews with staff. Visual inspection	(a) Plant and equipment maintenance records. (b) Staff training records. (c) position descriptions for plant operators.	C	Plant and equipment at the site was opportunistically observed by the Auditor to be in a good state of repair. Plant maintenance records were sighted by the Auditor.	C	N/A
6	O3.1	Maintain the premises in a condition which minimises dust emissions	Document review Visual inspection	Monitoring reports - quarterly (Pacific Environment)	C	Minimal dust emissions were observed by the Audit team during the audit site visit of 10th June 2015; water sprinklers were present and functional where fine granular product was stockpiled. A water cart was observed wetting down surface roads. The auditor reviewed dust monitoring reports (Pacific Environment Ltd, seven reports spanning 2013 to 2015). The reports did not indicate excessive dust was emitted from the site.	C	N/A
7	O3.4	Ensure that stockpiles are kept wet during the transfer of waste to and from the stockpile and during processing	Visual inspection	N/A	C	The Audit team observed water sprinklers and sprays in the product stockpile area during the site visit of 10th June 2015. Water sprinklers were also observed on the screening plants.	C	N/A
8	O5.3	Procedures in place to minimise the risk of fire at the premises	Document review	Emergency Evacuation Management Plan.	C	The plan was sighted on the 10th June 2015. Review of the plan indicates it contains provisions to reduce the likelihood of fires.	C	N/A
9	O5.4	The licensee must take all practicable steps to control entry to the premises.	Visual inspection		C	The part of the site subject to this EPL is surrounded by a perimeter chain link fence.	C	N/A
10	O5.7	All stormwater and stormwater treatment devices (including drainage systems, sumps and traps) must be regularly maintained.	Visual inspection Document review	Scheduled maintenance records "OSD Cleaning - Eastern Creek gross pollutant traps.". EHS WORK INSTRUCTION - Site Water Infrastructure Management.	C	The Audit team did not observe any blockages within the stormwater drainage or treatment infrastructure in the parts of the site to which this EPL applies. The Auditor sighted maintenance records for the OSD basins.	C	N/A
11	O5.8	Sediment ponds must be maintained in a manner that ensures these retain an appropriate freeboard to minimise the potential for any turbid discharge. Depth indicators must be installed and maintained within these ponds that indicate the required freeboard to be maintained.	Visual inspection Document review	Scheduled maintenance records "OSD Cleaning - Eastern Creek gross pollutant traps.". EHS WORK INSTRUCTION - Site Water Infrastructure Management.	C	The OSD ponds were observed by the Audit team to be approximately half full on the date of the site inspection (10/6/15). Depth indicators were present.	C	N/A
12	O6.10	The licensee must continuously operate video surveillance cameras at all weighbridges associated with the conveyor belt transfer system.	Visual inspection.	N/A	C	The Audit team observed four surveillance cameras in operation at the weighbridge.	C	N/A

13	O6.13	The licensee must submit to the EPA's Waste Operations every 6 months, a volumetric survey of the Premises carried out by a registered surveyor: a) During June each year and provided to the EPA in the approved form and manner by no later than 31 July in that year; and b) During December each year and provided to the EPA in the approved form and manner by no later than 31 January in that year.	Document review	Four volumetric surveys of the premises - one every six months for the past two years.	C	The Auditor sighted four volumetric surveys dated June 2013, December 2013, June 2014, June 2015.	C	N/A
14	O7.3	The licensee must: a) Implement suitable measures to prevent unnecessary proliferation of litter both on and off site; and b) Inspect and clear the site and surrounding area of litter on a daily basis.	Document review. Visual inspection.	"Weekly roster for the Eastern Creek litter pick up"	C	The Audit team observed minimal litter on the site during the inspection of 10 June 2015. The Auditor sighted a document titled "Weekly roster for the Eastern Creek litter pick up".	C	N/A
5: Monitoring and Recording Conditions								
15	M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Document review	Representative examples of air, surface water and groundwater monitoring records dating back up to four years from the audit date.	C	The Auditor sighted a sample of groundwater and surface water monitoring records dating back to 2012. The Auditor sighted a sample of air quality monitoring records dating back to 2013. All records were in Microsoft Excel format and in a legible form.	C	N/A
16	M4.2	Weather station: Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.	Document review.	N/A	C	The Auditor sighted the rainfall monitoring records dating back to 2012. Data is collected in mm per 24 hour period.	C	N/A
17	M5.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Document review.	Complaints dated February 2013, April 2013, July 2014. Complaint summaries hosted on DADI website.	C	The Auditor sighted compliant records dating to 2013 in the form of email correspondence. Additionally, complaint summaries are hosted on the DADI website dating back to 2010.	C	N/A
18	M6.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Inspection.	N/A	C	J Peart telephoned complaints line 10/6/15 9.38am and spoke to a DADI staff member called Michael who requested details of the complaint.	C	N/A
6: Reporting Conditions								
19	R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below.	Document review.	EPL annual returns for 2013/2014	C	The Auditor sighted annual returns for 2012-2013, 2013-14 for EPL 20121.	C	N/A
20	R2.3	If the results of surface water quality monitoring in the sediment pond(s) required by condition M2.2 indicate ammonia concentrations greater than 1mg/L the licensee must contact the EPA within 24 hours and advise of the results of that monitoring.	Document review.	Genesis SWQ_Database_200415	C	Monitoring is undertaken by Ian Grey Consulting. The Auditee advises not exceedances have occurred and no external reporting was required. Review of the monitoring records by the Auditor supports this conclusion.	C	It is recommended that a procedure be established and documented for the immediate review of results and communication of the results to management followed by reporting to the EPA (if required).
7: General Conditions								
21	G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Visual inspection.	N/A	C	EPL is located in the site offices, sighted by the Auditor on 10th June 2015.	C	N/A
8: Special Conditions								
22	E3.1	While the licensee's premises are being used for the purpose to which the licence relates, the licensee must: a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents. b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA. c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.	(a) Visual inspection (workshop premises, OSD basins, leachate storage), spill kits. Document review. (b) refused loads, (C) Annual returns.	Incident reports including rectification and close-out records (including those associated with leaks, spills).	C	A limited number of small spillages/staining were observed on hardstand surfaces by the audit team on the 10th June 2015. Review of a sample of incident reports for spills suggests spills were cleaned up within a reasonable period of time. The audit team observed a truck loaded with mixed waste deposit its load in the processing facility. Asbestos Containing Materials were identified in the load by site staff and the waste was loaded back into the truck and subsequently removed from the site.	C	N/A

PROJECT AUDIT								
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Item	**Condition**	**Requirement**	**Methodology**	**Documentation Reviewed**	**Auditee Assertion**	**Auditors Observations / Notes**	**Auditors Conclusion**	**Recommendations**
ENVIRONMENTAL PROTECTION LICENCE 13426 - LANDFILLING OF LANDFILLING OF GENERAL SOLID WASTE (NON-PUTRESCIBLE), TYRES AND ASBESTOS WASTE								
3: Limit Conditions								
23	L1.2	The Licensee must operate the premises in a manner that ensures that all stormwater from all areas of the premises which has the potential to mobilise sediments and other material is controlled and diverted through appropriate erosion and sediment control/pollution control measures and sedimentation ponds.	Visual inspection.	N/A	C	The audit team sighted a number of the stormwater channels across the site. They were typically engineered channels and appeared to be fit for purpose.	C	N/A
24	L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	Document review.	Surface water quality monitoring records.	C	The Auditor reviewed surface water monitoring records for point 5. An exceedance for pH was reported for 23/02/2013.	NC	N/A
25	L5.1	Operating hours for all activities at the Premises must be limited to between 7:00am and 6:00pm Monday to Friday, and 8:00am to 4:00pm Saturday, Sunday and Public Holidays.	Document review.	A representative sample of weighbridge receipts.	C	The Auditor sighted weighbridge receipts for the first and last vehicle of they day.	C	N/A
4:Operating Conditions								
26	O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.	Visual inspection.	N/A	C	The audit team observed minimal dust emissions during the site inspection undertaken on 10th June 2015. Sprinklers were present and operational on stockpiles and a water cart was observed wetting down roadways.	C	N/A
27	O4.4	The Licensee must minimise the tracking of waste and mud by vehicles leaving the premises.	Visual inspection.	N/A	C	A vehicle wheel wash was sighted at the top of the landfill void. Rumble strips were present on the roadway leading down to the OSR basins. Minor quantities of dirt were visible on the public road where it joins to the site roadway.	C	N/A
28	O5.2	There must be no incineration or burning of any waste at the premises.	Visual inspection, staff interviews.	N/A	C	The audit team did not observe any evidence of burning or incineration during the inspection of 11 June 2015. DADI management contend no burning occurs.	C	N/A
29	O5.7	Landfill leachate must not be irrigated except as expressly permitted by a condition of this licence.	Document review. Visual inspection.	The Leachate Collection, Conveyance and Management System (Crespi Projects, 2011).	C	The Leachate Collection, Conveyance and Management System was reviewed by the audit team; the document describes the process for collection of leachate from the landfill and disposal via the metropolitan sewerage system. The audit team observed the process for water cart filling; the water cart was filled using stormwater arising from rooftop rainwater harvest.	C	N/A
30	O6.2	The proponent shall: a) Implement suitable measures to prevent unnecessary proliferation of litter both on and off site; and b) Inspect and clear the site and surrounding area, of litter on a daily basis.	Document review. Visual inspection.	"Weekly roster for the Eastern Creek litter pick up"	C	The Audit team observed minimal litter on the site during the inspection of 10 June 2015. The Auditor sighted a document titled "Weekly roster for the Eastern Creek litter pick up".	C	N/A
31	O6.3	The applicant must control pests and vermin at the premises.	Document review. Visual inspection.	Pests, Vermin and Weeds Management Plan (June 2011). Four invoices for weed control.	C	The Auditor has not sighted any evidence that pests and vermin have been actively controlled on the site during the audit timeframe.	NC	Refer to item 44
5: Monitoring and Recording Conditions								
32	M4.1	Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.	Document review.	Rainfall records.	C	The Auditor sighted the rainfall monitoring records dating back to 2012. Data is collected in mm per 24 hour period.	C	N/A

33	M5.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Document review.	Complaint records for the last four years: complaints dated February 2013, April 2013, July 2014.	C	The Auditor sighted compliant records dating to the commencement of operations on the site. It is noted that complaints are generally referred to the EPA, who passes the complaints onto site management.	C	N/A
34	M5.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Document review.	Complaints dated February 2013, April 2013, July 2014. Complaint summaries hosted on DADI website.	C	The Auditor sighted compliant records dating to 2013 in the form of email correspondence. Additionally, complaint summaries are hosted on the DADI website dating back to 2010.	C	N/A
35	M7.4	The Licensee must monitor and record, weekly, the height of the leachate relative to the Australian Height Datum at EPA Points 26 and 27.	Document review.	Document titled "35 Leachate Level"	C	The document contains records of leachate height monitoring at two hourly intervals.	C	N/A
6: Reporting Conditions								
36	R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: a) a Statement of Compliance; and b) a Monitoring and Complaints Summary. At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	Document review.	Annual returns for 2013 and 2014.	C	A sample of annual returns were sighted by the Auditor on 10/6/15 10.16 am. The return sighted was complete.	C	N/A
37	R2.1	The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	Document review.	A sample of incident reports for the audit timeframe.	C	DADI management indicate that no incidents requiring external reporting have occurred within the audit timeframe. The Auditor reviewed the incident reports for incidents assessed by DADI to be their the most significant incidents that have occurred during the audit timeframe. On the basis of the information provided by DADI, the auditor concurs with the auditee that these incidents did not warrant external reporting. It is noted that the process for effectively assessing the significance of each incident, and for evaluating whether is has resulted in 'material harm to the environment' could be improved.	C	Prepare, implement and maintain a procedure for evaluating the significance of environmental incidents and external reporting of such incidents. Clarify scenarios that would constitute material environmental harm and detail the reporting process that would be undertaken in response to such incidents.
7: General Conditions								
38	G1.1	A copy of this licence must be kept at the premises to which the licence applies.	Visual inspection.	N/A	C	EPL is located in the site offices, sighted by the Auditor on 10th June 2015.	C	N/A
7: Special Conditions								
39	E3.2	In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must: a) make all efforts to contain all firewater on the licensee's premises, b) make all efforts to control air pollution from the licensee's premises, c) make all efforts to contain any discharge, spill or run-off from the licensee's premises, d) make all efforts to prevent flood water entering the licensee's premises, e) remediate and rehabilitate any exposed areas of soil and/or waste, f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of, g) at the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises, h) at the request of the EPA monitor surface water leaving the licensee's premises; and i) ensure the licensee's premises is secure.	Document review.	Correspondence between Christopher Biggs of DADI and the Director General of the DP&I dated 1/03/2013, regarding an incident that occurred on the 29 th January 2013.	C	Review of the correspondence indicates a breach of the 'clean water' dam within the pit occurred during a storm event. It further indicates that this water was contained within the pit and subsequently disposed - of as trade waste.	C	It is recommended that DADI keep records of all pre-emptive housekeeping activities that are undertaken in preparation for inclement weather events.
40	E7.2	The Licensee must provide to the EPA by 17 December 2013 design specifications for a leachate monitoring well within Lot 1 DP 1145808 that will be designed to be functional for the life of the landfill that includes; i. Material specifications; ii. Structural calculations; iii. Cross sectional drawings; iv. Schedule for construction; and v. Location plan.	Document review.	Leachate well design specifications contained within correspondence between Ian Grey Consulting and John Ingold of the EPA dated 5th February 2014	C	The Auditor sighted the previously mentioned correspondence.	C	N/A

PROJECT AUDIT

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Item	Section	Requirement	Methodology	Documentation Reviewed	Auditee Assertion	Auditors Observations / Notes	Auditors Conclusion	Recommendations
				PROJECT APPROVAL 06_0139				
Schedule 2: Administrative Conditions								
41	06_0139-2,5	The Proponent shall not receive more than 2 million tonnes of materials at the site per calendar year.	Document review.	"Genesis Facility Incoming Waste Report 1 January 2014 - 31 December 2014"	C	The Auditor sighted a cumulative incoming waste summary for the period of 1 January 2014 to 31 December 2014. The summary indicated 899 673 tonnes of material had been received over this period.	C	N/A
Schedule 3: Specific Environmental Conditions								
42	06_0139-3,2a	Implement suitable procedures to: - ensure that the site does not accept wastes that are prohibited; and - screen incoming waste loads.	Document review.	Spotters Training Manual (May 2015). Incoming product testing register.	C	The Auditor sighted the previously mentioned procedures. These are deemed to be generally suitable for their intended purpose. It is noted that the nature of the inspection process is such that bulk asbestos waste would generally be detected. It is unclear whether small quantities of asbestos cement sheeting mixed with soil or friable asbestos containing materials would be detected (eg insulation lagging and other forms of friable asbestos).	C	Undertake periodic Quality Assurance / Quality Control testing of the finished granular products to verify that fugitive asbestos is not present within the product(s).
43	06_0139-3,8	The Proponent shall prepare and implement a Landfill Plan for the Project to manage the disposal of material into the void to ensure a suitable level of compaction occurs. The Plan must: a) be to the satisfaction of the Director-General; b) be submitted within 12 months of commencing operations; c) be submitted every 3 years during the life of the operation (coinciding with the independent environmental audit required at Schedule 4, condition 4); and d) be submitted 12 months prior to the closure of the landfill; e) be conducted by a suitably qualified, experienced, and independent engineer (or other relevant expert) whose appointment has been endorsed by the Director- General; f) detail the proposed disposal methodology to achieve a suitable level of compaction; g) include a criteria or level of compaction target for the landfill, with the view to types of uses post-land filling of the void; h) outline a process to monitor the performance of the disposal methodology, compaction and settling rates; and i) contingency measures should the rates not be achieved; and j) procedures for reporting the components of this Plan.	Document review - plan submitted and approved within 12 months of operation.	"Landfill Environmental Management Plan - Former Quarry Site At Wonderland Drive Eastern Creek General Solid Waste (Non-Putrescible) Landfill Associated With An Adjacent Materials Processing Centre (MPC) Waste Transfer Facility" (Douglas Partners, June 2015)	C	The Auditor sighted a Landfill Environmental Management Plan prepared for the site in June 2015. It is unclear whether this this Plan has been prepared to the satisfaction of the Director General or by an author endorsed by the Director- General. A detailed assessment of the suitability of this plan is outside the scope of this audit.	C	N/A
44	06_0139-3,14	The Proponent shall: a) Implement suitable measures to manage pests, vermin, feral animals and declared noxious weeds on site and identify those measures in the Environmental Management Strategy for the Project (See Schedule 5 condition 1) b) Inspect the site on a regular basis to ensure that these measures are working effectively, and that pests, vermin, feral animals or noxious weeds are not present on site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in the surrounding area; and c) Perform ongoing monitoring of weed infestation on and adjoining the site.	Document review.	Pests, Vermin and Weeds Management Plan (June 2011). Four invoices for weed control.	C	The audit team observed significant densities of Pampas Grass (genus Cortaderia) across vegetated parts of the site, including the pit walls, berms ane elsewhere. Review of the Noxious Weeds (Weed Control) Order 2014 indicates this species is not a declared noxious weed in the City of Blacktown. The audit team observed two feral animals (foxes) during the site inspection of 10th June 2015. The Auditor has sighted evidence of ongoing weed control activities on the site. While formalised weed monitoring has not been documented, the Auditor is of the opinion that management are making an active effort to control weeds, in general fulfilment of this condition.	C	Initiate a pests, vermin and feral animal control program. Implement a robust monitoring program to (a) characterise the populations of weeds and vermin / feral animals on the site (and adjacent sites) and (b) verify that the control measures implemented are being successful in controlling these populations.
45	06_0139-3,16(b)	The Proponent shall prepare a Conveyor and Chute System Maintenance and Management Plan. The Plan shall: a) be submitted to the Director-General for approval prior to the commencement of operation; b) include a maintenance schedule; c) detail contingency measures in the event that the system breaks down, or is not coping with the intended quantities of waste; and d) detail contingency measures to remove asbestos waste from the system should it be detected.	Document review.	Conveyor and Chute System Maintenance and Management Plan	C	The Auditor sighted the Conveyor and Chute System Maintenance and Management Plan on the 12th June 2015. (a) The plan is endorsed by the Director General (b) The plan includes a maintenance schedule, (c) contains contingency measures in th event the system breaks down, and (d) the plan contains contingency measures to remove asbestos waste from the system in the event is detected.	C	N/A
46	06_0139-3,32	The Proponent shall implement all reasonable and feasible measures to minimise the dust generated by the project.	Visual inspection.	N/A	C	The audit team observed minimal dust emissions during the site inspection undertaken on 10th June 2015. Sprinklers were present and operational on stockpiles of finished product and within the MPC, and a water cart was observed wetting down roadways.	C	N/A
47	06_0139-3,33	The Proponent shall seal all internal haul roads within the operational area of the project (see Operational Area at Appendix 3), with the exception of haul roads within the quarry void itself.	Visual inspection.	N/A	C	The audit team visited all major operational parts of the site on the 10th June 2015, during this site visit all internal haul roads were observed to be of concrete construction.	C	N/A

48	06_0139-3,36	The Proponent shall implement all reasonable and feasible measures to minimise: a) energy use on site; and b) the scope 1, 2 and 3 greenhouse gas emissions produced on site, to the satisfaction of the Director-General.	Document review.	"Genesis Electricity usage analysis" - undated document.	C	The Auditor sighted a document titled "GENESIS Electricity usage analysis". The document depicted the site's month by month electricity usage.	C	N/A
49	06_0139-3,37	The Proponent shall prepare and implement an Air Quality, Odour and Green House Gas Management Plan for the project to the satisfaction of the Director-General.	Document review.	Air Quality, Odour and Greenhouse Gas Management Plan (June 2011)	C	Management Plan sighted by the Auditor on 10/6/15 - 11.16am. The management plan has been endorsed by the Director General.	C	N/A
50	06_0139-3,38	The Proponent shall ensure that noise from the project does not exceed the noise limits in Table 4 (36dB(A))	Document review.	A) Material Processing Centre Noise Assessment (Pacific Environment, 27 June 2013) (B) Genesis Waste Facility Pre-Sort Enclosure Noise Assessment (Pacific Environment, 22 May 2015) (C) Material Processing Centre Noise Assessment (Pacific Environment, 2 September 2013)	C	The Auditor sighted three noise reports prepared in 2013. The reports concluded that noise levels at the nearest receivers are likely to be below the specified noise limits. It is noted that the conclusions drawn by the assessments are largely based on modelling rather than actual noise level monitoring at the receivers.	C	N/A
51	06_0139-3,40	The Proponent shall prepare and implement a Noise Monitoring Program for the development, in consultation with DECCW, and to the satisfaction of the Director-General. This program must be submitted to the Director-General for approval prior to commencement of operations, and include a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval.	Document review.	Noise Monitoring Program (June 2011)	C	The Auditor sighted the Noise Monitoring Program on the 10th June 2015. The endorsement by the Director General was sighted by the Auditor .	C	N/A
52	06_0139-3,41	For the life of the Project, the Proponent shall ensure that there is a suitable meteorological station in the vicinity of the site that complies with the requirements in the latest version of Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Document review. Visual inspection (of weather station).	Four invoices for the maintenance of the weather station (from Davcol Electrical Services)	C	The Audit team sighted the weather station. It is unclear whether the installed station complies with Approved Methods for Sampling of Air Pollutants in New South Wales guideline. The audit team noted that the measurements of the anemometer may be affected by the presence of nearby structures.	C	During the Environmental Audit scheduled for 2017, provide certification that the weather station is compliant with the applicable guideline.
53	06_0139-3,54	Prior to the commencement of operations, the Proponent shall: a) construct and maintain, for the duration of the operations, amenity berms, impervious barriers and visual screens around the perimeter of the operational area (as detailed in the EA, the site plan at Appendix 1 and Schedule 3, Condition 53 above); b) retain the existing amenity berm to the north east of the quarry void at the perimeter; c) vegetate the berms in accordance with the Landscape and Vegetation Management Plan at Schedule 3, condition 59; d) maintain the height of the amenity berms at no less than 10 metres; and e) conduct all earth works required to reshape the amenity berms on site, without impacting on adjoining landowners.	Visual inspection.	N/A	C	The audit team inspected a number of the amenity berms and confirmed that they are present, at the correct height and are vegetated, primarily with native species. It is noted that weeds have become established on the berms.	C	N/A
54	06_0139-3,61	The Proponent shall prepare and implement an Aboriginal Heritage Management Plan, in consultation with the DECCW, and to the satisfaction of the Director-General.	Document review.	Aboriginal Heritage Management Plan (Light Horse Business Centre, 2011) and correspondence between Chris Wilson (Planning) and Ian Malouf (DADI) dated 5.12.11.	C	The Management Plan and endorsement by the Director General was sighted by the Auditor.	C	N/A
Schedule 5: Environmental Management, Reporting & Auditing								
55	06_0139-5,4	Within 3 months of the submission of an: a) audit under condition 7 of schedule 5; b) incident report under condition 5 of schedule 5; and c) annual review under condition 3 of schedule 5, the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.	Document review.	Copies of all management plans, programs and procedures required under this consent.	TBC	All current and superseded versions of management plans, programs and procedures required under this consent were reviewed. Plans sighted were dated 2013 (Aboriginal Heritage, Air Quality), 2011 (Amenity Berms, Green Waste, Landscape and Vegetation, Fencing and Security, Pests and Vermin, Soil Water and Leachate). The Auditor has sighted no evidence to suggest that these plans or procedures were reviewed or updated in accordance with the timing of sub-point (a) or (c). The Auditor notes a number of management plans were reviewed and updated following the current audit process.	NC	N/A
56	06_0139-5,7	Within 6 months of the commencement of operation, and every 2 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project.	Document review.	Cardno Audit Report - Genesis Landfill May 2012	C	Cardno undertook an Independent Audit at the site in 2012, the current audit fulfils the secondary requirement.	C	N/A

PROJECT AUDIT								
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Item	**Condition**	**Requirement**	**Methodology**	**Documentation Reviewed**	**Auditee Assertion**	**Auditors Observations / Notes**	**Auditors Conclusion**	**Recommendations**
LIGHT HORSE BUSINESS CENTRE VOLUME 1: ENVIRONMENTAL ASSESSMENT REPORT (ERM 2008), DRAFT STATEMENT OF COMMITMENTS								
3: Construction and Operation EMP								
57	3	A Construction Environmental Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP) will be developed and approved by the Director- General	Document Review	Environmental Management Strategy (Light Horse Business Centre, 2011) and record of endorsement by the Department of Planning	C	The Auditor has reviewed the Environmental Management Strategy for the project and is of the opinion that it generally fulfils the requirements of a CEMP and OEMP. The endorsement by the Director General was sighted by the Auditor.	C	N/A
5. Operational Environmental Performance								
58	5.1.1	A detailed stormwater management plan shall be developed and include the requirements set out in the Surface Water Report prepared by Storm Consulting dated April 2008, which will include management for spills from drainage lines, sediment traps, check dams, erosions control, bunds infiltration areas, sediment fences, filters and all other erosion and sediment control devices.	Document Review	Soil, Water and Leachate Management Plan (Douglas Partners, 2011).	C	The Auditor has reviewed the Soil, Water and Leachate Management Plan, and is of the opinion that the plan substantially addresses the requirements outlined in this commitment.	C	N/A
59	5.4.2	Monitoring will be undertaken as per DECC (1996) Environment Guidelines: Solid Waste Landfills for the gas management system. Unless otherwise approved by DECC, monitoring will be conducted monthly for initial operations, and if no adverse impacts are observed, will be reduced to quarterly after six months of operations and to annually after 18 months of operation.	The Auditor accepts the Auditee's assertion.	N/A	NC	Auditee indicates a survey was undertaken in May 2015, however the report has yet to be issued. No other landfill gas surveys have been undertaken in the 24 months preceding this audit.	NC	Undertake landfill gas survey in accordance with regulatory requirements.
60	5.4.3	An Air Quality Management Plan (AQMP) shall be prepared which will be included in the LEMP and EWMP to be developed for the Project, with a focus on activities which generate the most significant emissions – in this instance those associated with haulage movements and transfer and loading activities.	Document Review	Air Quality, Odour and Greenhouse Gas Management Plan (Light Horse Business Centre, 2011)	C	The Plan was sighted by the Auditor on 10th June 2015.	C	N/A
61	5.5.4	A log of noise complaints will be maintained and actioned in a responsive manner.	Document Review	Complaints register (available on DADI website)	C		C	N/A
62	5.7.2	LHBC will operate outdoor lighting in accordance with Australian Standards AS4282-1977 'Control of Obtrusive Effects of Outdoor Lighting' and AS1158 'Lighting for Roads and Public Places'. The lighting will be kept to the minimum necessary to safety and efficiency purposes and will be directed away from residences and roads through the use of directional lighting equipment and shielding.	Visual inspection.	Lighting Plan' prepared by Webb Australia (2011)	C	The Lighting Plan sighted by the Auditor confirms lighting has been designed in accordance with Australian Standards.	C	N/A
63	5.7.3	LHBC will maintain building elements using muted colours which blend into the surrounding natural environment.	Visual inspection.		C	The audit team did not observe any obtrusive finishes on maintenance works carried out in the 24 months preceding the audit.	C	N/A
64	5.8.1	The risk of soil contamination by spills will be minimised throughout the Project by implementation of appropriate procedures for safe handling and storage of fuel and chemicals and spill response procedures.	Document Review	The Oil Spill Clean Up Procedure (no author, no date), Pollution Incident Response Management Plan (Genesis, 2012).	TBC	The Auditor has reviewed the Oil Spill Clean Up Procedure (no author, no date), Pollution Incident Response Management Plan (Genesis, 2012).	C	It is recommended that specific chemical and hydrocarbon handling procedures are prepared to guide staff undertake tasks that involve these substances (eg servicing, refueling of plant and equipment).
65	5.9.1	A Site Environmental Waste Management Plan (SEWMP) shall be produced to manage general waste streams produced during operations. The SEWMP shall be made available to all operational staff upon commencement of employment. The SEWMP shall ensure putrescible waste and recycling waste receptacles are provided within the RRF and associated buildings. The SEWMP will ensure that all putrescible waste shall be collected and disposed of off-site.	Document Review	Site Environmental Waste Management Plan (Douglas Partners, 2015)	C		C	N/A
66	5.10.2	Undertake an internal review annually to identify techniques to minimise energy use and assess if equipment is operating at optimum energy efficiency. Internal review to address inventory of emissions levels.	Document Review	"GENESIS Electricity usage analysis" - undated document.	C	The Auditor sighted a document titled "GENESIS Electricity usage analysis". The document depicted the site's month by month electricity usage. The Auditor is advised that this document is used to undertake regular (informal) reviews of energy efficiency.	C	Formalise the existing energy usage reviews to ensure records are kept in fulfillment of this condition.

PROJECT AUDIT								
					*C = Conformant NC = Non-Conformant N/A = Not Applicable			
Item	**Section**	**Requirement**	**Methodology**	**Documentation Reviewed**	**Auditee Assertion**	**Auditors Observations / Notes**	**Auditors Conclusion**	**Recommendations**
AIR QUALITY, ODOUR AND GREENHOUSE GAS MANAGEMENT PLAN								
67	2.2	An anemometer shall be maintained on the site at all times and shall be installed and operated in accordance with its manufacturers instructions. The anemometer shall be maintained and checked regularly to ensure it is in good working order during the hours of operation of the site	Visual inspection. Document review.	Invoices from Davol Pty Ltd.	C	Two anemometers were observed during the site inspection of 10th June 2015. The Audit team was informed that one was working. The working anemometer was located within the weighbridge shed. The Auditor sighted invoices from Davol Pty Ltd for the maintenance of the weather station during the 24 months preceding the audit.	C	It is recommended that written confirmation be obtained from suitably qualified persons to the effect that the weather system has been installed in accordance with the manufacturers instructions.
68		Water sprays or a suitable alternative dust control measure will operate on any above ground uncovered or unsheltered stockpiles to reduce wind erosion	Visual inspection	N/A	C	The audit team observed that sprinklers were present and operational on finished product stockpiles during the site inspection of 10th June 2015.	C	N/A
69	3.1	In accordance with the benchmark requirements, annual gas monitoring survey of the landfilled sites will be conducted for LFG emissions	The Auditor accepts the Auditee's assertion.	N/A	NC	The auditee indicates a LFG survey has been commissioned and the Auditor understands the survey was undertaken concurrently with the audit, however no LFG surveys were undertaken in the 24 months preceding the audit.	NC	Refer to item 59
AMENITY BERMS MANAGEMENT PLAN								
70		Where necessary to prevent soil erosion or soil movement, stabilise embankments. As a minimum this should be on slopes > 1 in 3. Stabilise embankments using a proprietary geotextile fabric suitable and fit for the purpose of embankment stabilisation. Plant after matting is installed.	Visual inspection	N/A	C	The Audit team observed erosion (vertical rilling) at a depth of approximately 150 mm on one amenity berm. Amenity berms on the site were generally constructed with slope angles of < 1 in 3, and engineered stabilisation was not observed.	NC	Engage suitably qualified and competent persons to undertake erosion monitoring across the site on a regular basis. Rectify any incidences of erosion promptly.
ASBESTOS HANDLING PREOCEDURE EASTERN CREEK								
71		Checking and inspection of incoming materials prior to stockpiling or processing to minimise the risk of asbestos wastes as follows: a. First inspection will be conducted when the load arrives at the facility; and b. The second inspection will take place during or after the load is tipped on the ground prior to sorting	Visual inspection	N/A	C	The Audit team observed three stages of load checking during the site inspection of 10th June 2015: at the weighbridge, at the spotters stations and at the point of tipping.	C	N/A
72		Any asbestos accepted via bin waste is to be tipped into the bin allocated for this purpose. The bin is to be lined in plastic. This lining is to overlap the sides of the bin so that it can be pulled over the top of the bin and secured by adhesive tape.	Visual inspection	Photographs of incoming asbestos bins provided by the Auditee.	C	The Auditor has sighted photographs taken from the weighbridge CCTV system which show incoming asbestos waste packaged correctly. The Auditor believes these images to be representative.	C	N/A
EMERGENCY FIRE AND RESPONSE PLAN								
73		Woodwaste may be received at the site and may be stockpiled at the greenwaste/woodwaste area which is concreted and surrounded by concrete walls. No wood waste is stockpiled for more than 12 months.	Visual inspection. Document review.	N/A	C	The Audit team observed wood waste stored within the designated concreted area. Records could not be sighted for the purpose of verifying the duration of storage. The Auditor notes that no composting of wood waste is currently undertaken at the site. Wood (timber) waste is accepted, shredded and sold into the landscaping industry. The Auditor accepts that on the balance of probability, wood waste is not stockpiled on the site for more than 12 months.	C	N/A
FENCING AND SECURITY MANAGEMENT PLAN								
74	1	The Proponent shall: a) prevent unauthorised entry to the site; and b) install and maintain a perimeter stock fence and lockable security gates on site.	Visual inspection	N/A	C	The audit team observed evidence of unauthorised access to the site off Archibold Road, consisting of sections of damaged fence and vehicle tracks leading into the site.	NC	Regularly monitor the security of the site and promptly repair damaged fences.
GREEN WASTE MANAGEMENT PLAN								
75		Incoming materials will be supervised at time of tipping to facilitate removal of contaminating or non biodegradable materials and also materials which bio-degrade at a slower pace and may thereby inhibit the overall process. Engineered wood products (eg MDF) and preservative-treated and coated wood residues [eg Copper Chrome Arsenate treated timbers], each as defined in the Raw Mulch Exemption 2008, will also be removed at this stage.	Document review. Visual inspection of tipping process.	Spotters Training Manual (May 2015).	C	The Auditor deems the first part of this criterion irrelevant to the operation of project; only low biodegradation timber materials are accepted and no composting takes place on site. With respect to the second part of the criterion, the Auditor has reviewed the spotters manual and the manual details the procedures that the staff follow when checking the contents of incoming loads. The audit team observed telegraph poles (presumed chemically treated) in the timber area, separated from the shredded timber products; the Auditor is advised by the Auditee that these are not shredded, and are sold on in unprocessed form.	C	N/A
76		Leachate collection sumps will collect run off leachate and re-circulate it for re-use to aid the biodegradation and dust control (in respect of processed woodchip and greenwaste).	Visual inspection.	N/A	C	Review of the leachate management system indicates leachate is collected from this facility however it is disposed of via the metropolitan sewerage system in accordance with a trade waste agreement. The Auditor was advised that stormwater and mains water is used for dust suppression.	C	N/A

GROUNDWATER MONITORING PLAN								
77	8	Quarterly groundwater level monitoring in all 14 active bores.	Document review.	Document titled "77 Groundwater Level Monitoring"	C	Groundwater level monitoring data was sighted.	C	N/A
78	8	Groundwater level and groundwater quality data will be added to the databases after each quarterly monitoring event. The data will be reviewed briefly and an exception report provided identifying any unusual results. Re-analysis or re-sampling will be considered for any such results. Groundwater levels should be compared to the hydraulic level in the leachate drainage system and any changes in the inward hydraulic gradient noted.	Document review.	Genesis GWQ Database 200415	C	The Auditor reviewed the groundwater monitoring database for the site. The data indicates there are 17 active bores that are subject to monitoring. Data exists for one monitoring event in 2012, two events in 2013, one event in 2014 and three events in 2015 (all within the month of February). The monitoring has not been undertaken in accordance with the quarterly schedule. Furthermore no interpretive reports were available for review (noting petroleum hydrocarbons were detected within one well in 2014). On balance the Auditor has formed the opinion that this commitment has not been satisfied.	NC	Ensure groundwater monitoring is undertaken at the required frequencies and interpretative reports are prepared in response to unusual results.
LANDSCAPE AND VEGETATION MANAGEMENT PLAN								
79		All visual bunds or vegetation screens will utilise native species and weed control will be undertaken as necessary, in accordance with Abel.	Visual inspection.	N/A	C	A linear planting of (exotic) cyprus pines was observed by the Audit team along the southern boundary of the site. In the Auditors opinion, this planting constitutes a vegetation screen. It is noted that Cyprus Pine is recommended as barrier planting in other management plans.	NC	Review the Landscape and Vegetation Management Plan to ensure consistency with other plans.
80		Weed Control and Vegetation Management will be carried out in accordance with the Schedule of Works in the Vegetation Management Plan (VMP).	Visual inspection Document review.	Review of invoices from weed control contractor.	C	Weed control has been carried out on the site at regular intervals.	C	N/A
LEACHATE COLLECTION,CONVEYANCE AND MANAGEMENT SYSTEM								
81		Leachate pumps are installed at the base of risers and operational. Leachate is pumped into suitable leachate storage tanks.	Visual inspection.	Trade Waste Agreement invoices	C	The audit team sighted the leachate risers, and the leachate tanks. The Auditor sighted Trade Waste Agreement invoices to verify that leachate is disposed of via sewer.	C	N/A
82		The use of clay and or crushed shale bunding and inclusion of a leachate trench to separate leachate from stormwater from capped areas within the landfill shall be constructed to minimise surface water flows into active landfill areas.	Visual inspection.	N/A	C	The audit team sighted the surface water diversion trenches around the perimeter of the quarry void. These direct surface water (primarily from groundwater ingress) into a sump at the base of pit from where it is pumped out for treatment and re-use.	C	N/A
NOISE MONITORING PROGRAM								
83		Monitoring will take place when the site is fully operational. During the first 12 months of operation, data will be collected quarterly. If no exceedances, then it shall be six monthly. Results from the first 12 months will be collated and supplied to DoP within 3 months of the completion of monitoring	N/A	N/A	NC	The auditee indicates a noise monitoring event has been commissioned and is due to be undertaken in mid 2015, however no noise monitoring was undertaken in the 24 months preceding the audit.	NC	N/A
84		If fixed machinery is identified as being a source that exceeds noise trigger values the use of the machinery will cease until noise attenuation measures are implemented. If the noise source is a point source such as an engine or motor then the engine or motor will be housed in a suitably noise insulated cowling hood or structure.	Document review.	Genesis Waste Facility Pre-Sort Enclosure Noise Assessment (Pacific Environment, May 2015)	C	Fixed machinery was not identified as a source that exceeds trigger values in the previously mentioned report.	C	N/A
OIL SPILL CLEAN UP PROCEDURE/ OIL SPILL/FUEL / AD-BLUE CLEAN UP PROCEDURE								
85		The procedure is implemented and staff have undergone appropriate training.	Document review.	Training records for Oil Spill/Fuel/AD-Blue Clean Up Procedure	C	Training records sighted.	C	N/A
PESTS, VERMIN AND WEEDS MANAGEMENT PLAN (Also refer to VMP)								
86		The Proponent will ensure that vermin, birds and insects are controlled through maintaining the Landfill in a generally clean and tidy manner, including applying appropriate cover. Wastes are covered at the end of each daily shift, or in the case of odorous or offensive wastes immediately following disposal at the tipping face.	Visual inspection Document review.	"Genesis Landfill - Daily Procedures", Spotters Training Manual (May 2015). (odourous material), rejected loads records.	C	The audit team did not observe unusually high numbers of birds or other vermin. The landfill was observed to be in a generally clean and tidy state. The Genesis Landfill - Daily Procedures contained procedures for the application of daily cover.	C	N/A
POLLUTION INCIDENT RESPONSE MANAGEMENT PLAN								
87		The effectiveness of training modules and sessions shall be periodically (at least annually) reviewed and the modules updated	Document review.	The "Site Induction Training Manuals" dated 2013, 2014 and 201.	C	The Auditor reviewed the Site Induction Training Manuals. The Auditor notes that these are revised annually as a result of internal reviews of training effectiveness.	C	N/A
SITE SURFACE WATER MANAGEMENT PLAN								
88		Each building should have its own rainwater tank (min 10kL) for reuse on site	Visual inspection.	N/A	C	Each building on the site does not have an individual tank however there is a one million litre tank under the MPC for the storage of rainwater. The Auditor is of the opinion that the spirit of this condition is satisfied by the centralised storage tank.	C	N/A

89		Stormwater runoff control within the quarry pit is to be used to assist in reducing leachate volumes.	Visual inspection.	N/A	C	The audit team sighted the surface water diversion trenches around the perimeter of the quarry void. These direct surface water (primarily from groundwater ingress) into a sump at the base of pit from where it is pumped out for treatment and re-use.	C	N/A

SOIL, WATER AND LEACHATE MANAGEMENT PLAN								
90		Regular inspections of silt fences, water management safeguards.	Document review.	Invoice / quote 744 from Davcol Pty Ltd for the annual servicing of the Onsite Detention Basins (including both minor and major services).	C	On the day of the audit (10 June) one drainage sump at the diesel fuel farm was observed to be completely full of accumulated sediment the other sump was half full. All other water management infrastructure was in good condition. The Auditor has sighted an invoice from Davcol Pty Ltd for the annual servicing of the Onsite Detention Basins (including both minor and major services).	C	Prepare a surface water management infrastructure / pollution control infrastructure maintenance checklist to ensure all sumps, drains and bunds on site are checked and maintained regularly.
91		Leachate is suitably separated from stormwater from capped areas within the landfill.	Visual inspection.	N/A	C	The audit team sighted the surface water diversion trenches around the perimeter of the quarry void. These direct surface water (primarily from groundwater ingress) into a sump at the base of pit from where it is pumped out for treatment and re-use. Leachate percolates down to the base of the landfill where it collects. Leachate is pumped from a sub-surface sump to aboveground storage tanks prior to treatment and off-site disposal.	C	N/A
TRANSPORT MANAGEMENT CODE OF PRACTICE								
92		Signage of speed restrictions and directional signage are maintained and clearly visible.	Visual inspection	N/A	C	The audit team observed a number of speed restriction and directional signs. The Auditor is of the opinion that signage is generally of acceptable standard, however it is noted that this is not a traffic audit, and the Auditors comments in relation to traffic are general in nature.	C	N/A
93		Overloading for any haulage combination does not occur	Document review.	Weighbridge records for trucks moving product off-site.	C	The Auditor sighted a sample of weighbridge records. The Auditee advises that loading of products is performed by DADI and overloading does not occur.	C	N/A
CONVEYOR AND CHUTE SYSTEM MAINTENANCE AND MANAGEMENT PLAN / DETAILED DESIGN PLANS								
94		In satisfaction of Consent condition 16a (e), the Management Plan states the system will have a waste drop height of no more than 3 metres between the end of the sock and the base of the quarry.	Visual inspection.	N/A	TBC	The audit team observed a drop height of approximately 10 metres between the end of the chute and the base of the quarry during the site inspection of 10th June 2015. A sock was not connected to the base of the chute. Site management indicated to the Auditor that a drop height of 3m is not sufficient to allow access by a front end loader.	NC	Manage the drop height from the sock in accordance with the relevant management plan. Should the existing requirements be impractical, it is recommended DADI applies to the Department of Planning for the removal or modification of the condition. Any such change should be reflected in a revised version of the Management Plan.
95		In the unlikely event that Asbestos waste is detected in the chute system the Operator will immediately cease operation of the Culvert Conveyor and the Downhill Conveyor. An Inspection of the DASS shall be immediately carried out to identify and remove from the system any pieces of bonded asbestos. If the presence of Asbestos is confirmed then cleansing of conveyor belts with water shall take place in the presence and under the supervision of a qualified Asbestos Hygienist who shall document and report upon the measures undertaken.	Document review.	N/A	C	The Auditee indicates asbestos has not been identified within the chute and consequently the conveyor and chute system have required shut down and decontamination. The Auditor supports the Auditees contention, noting however that there is little prospect of asbestos being identified once it enters the conveyor-chute system, given the system is enclosed. The Auditor further notes that given the nature of the separation process, asbestos fibre cement would most likely end up in the tile and brick process stream, rather than on the conveyor to the chute.	C	N/A

PROJECT AUDIT							
				*C = Conformant NC = Non-Conformant N/A = Not Applicable			
Item	**Condition**	**Requirement**	**Methodology**	**Auditee Assertion**	**Auditors Observations / Notes**	**Auditors Conclusion**	**Recommendations**
BUSHFIRE HAZARD ASSESSMENT (HOLMES FIRE AND SAFETY, 31 July 2008)							
96	7 (a)	Asset Protection Zones should be implemented as specified within the Management Plan.	Document review, visual inspection	**TBC**	The Auditor has not sighted any evidence to suggest the Asset Protection Zones specified in the Bushfire Hazard Assessment are maintained.	NC	It is recommended that a Bushfire Management Plan be prepared to manage fire risk on the site, and that this plan be prepared in consideration of the ecological values of bushland on and around the site. It is recommended the Bushfire Management Plan supersede the Bushfire Hazard Assessment for the purposes of any future audits.
HERITAGE CONSERVATION STRATEGY FOR ABORIGINAL SITES IN THE LANDS OWNED BY VALAD FUNDS MANAGEMENT LTD AND SARGENTS P/L, IN THE EASTERN CREEK BUSINESS PARK (STAGE 3) PRECINCT PLAN BLACKTOWN, NSW. JULY 2015.							
97	3	A Plan of Management will be required to ensure the ongoing survival of high Aboriginal and archaeological (and flora and fauna) values in the designated conservation areas	Document review.	C	The Auditor sighted the Aboriginal Heritage Management Plan on the 10th June 2015.	C	N/A
LIGHT HORSE BUSINESS CENTRE NOISE IMPACT ASSESSMENT (ERM, 2008)							
98	Section 8	Constructing impervious barriers at various positions around the facility, including 10 m high barriers to the north, north west, west and south of the main area of operations and retention of the existing earth mound to the north east of the quarry pit. These barriers are included in the noise modelling results presented in this report.	Visual inspection	C	The Amenity Berms were observed by the audit team.	C	N/A
TRAFFIC IMPACT ASSESSMENT, PROPOSED RESOURCE RECOVERY AND LANDFILL FACILITIES QUARRY ROAD, EASTERN CREEK (TRANSPORT AND TRAFFIC PLANNING ASSOCIATES, 2008)							
99		Circulation Roadways: construct a sealed industrial standard road pavement (Council design standard)	Visual inspection	C	The audit team note that concrete sealed roads were present across the site.	C	N/A

PROJECT AUDIT								
					*C = Compliant NC = Non-Compliant N/A = Not Applicable			
Item	**Condition**	**Requirement**	**Methodology**	**Documentation Reviewed**	**Auditee Assertion**	**Auditors Observations / Notes**	**Auditors Conclusion**	**Recommendations**
CRITERIA DERIVED FROM REGULATORY CONSULTATION								
Sydney Water								
100		Green Waste Area Release Valve: A concern was raised about the location of a release valve in the green waste area, and in particular whether the location and height of the valve could compromise the integrity of the bund.	Visual Inspection.	N/A	**Auditee to advise**	The Audit team inspected the bund and deemed the placement of the valve to be suitable.	**C**	N/A
EPA								
101		Under the Protection of the Environment Operations (Waste) Regulation 2005, the site is required to have an operational weighbridge, video monitoring system, conduct annual volumetric surveys and provide monthly waste contribution reports to the EPA.	Document review.	Volumetric surveys and monthly waste contribution reports	**C**	The Auditor reviewed the weighbridge calibration records, sighted the video monitoring system and sighted two annual volumetric surveys.	**C**	N/A
102		The site and operations should be compliant with the NSW waste regulatory framework. Do products generated at the premises meet resource recovery exemptions?	Document review.	Testing and verification records in satisfaction of the requirements of The "continuous process" recovered fines order 2014.	**C**	The site produces two products that meet the definitions of The "continuous process" recovered fines order 2014 and the raw mulch order 2014	**C**	N/A

Genesis Landfill and Recycling Centre

APPENDIX C

AGENCY CONSULTATION

Cardno
Shaping the Future

NSW EPA

Our reference : DOC15/166491
EPA Contact : Jennifer Rowe

Mr Jolyon Peart
Cardno (NSW/ACT) Pty Ltd
PO BOX 19
St Leonards
NSW 1590

EMAIL AND STANDARD POST

Dear Mr Peart

Re: Genesis Recycling Centre and Landfill (EPL 20121 & 13426)

I refer to correspondence from Cardno (NSW/ACT) Pty Ltd dated the 14 May 2015 regarding Dial A Dump Industries to undertake an *Independent Environmental Audit* to satisfy Schedule 5, Condition 7 of Project Approval 06_0139 (as modified).

Reference is made to Genesis Facility located at Honey Comb Drive, Eastern Creek ("the premises"). Dial-A-Dump (EC) Pty Ltd (the "Licensee") currently holds the Environment Protection Licences 13426 and 20121 (the "Licenses").

The Environment Protection Authority ("EPA") has reviewed your correspondence and provides you with the following response regarding the complaints received about odours for the premises:

- Since the last environmental audit undertaken at the premises in 2012, the EPA has received two (2) odour complaints.
- The odour complaints were received on
  - 18 February 2013
  - 3 July 2014
- Details of both odour complaints have been forwarded on to the Licensee to investigate further the source of the odour.

Please contact the Licensee if further information is required regarding the odour complaints received by the EPA.

If you have any further questions regarding this matter please contact Jennifer Rowe on 02 9995 5883

Yours sincerely

25.5.15

Ruth Owler
Unit Head Waste Compliance
Environment Protection Authority

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Mr Jolyon Peart
Environmental Scientist
Cardno (NSW/ACT) Pty Ltd
PO Box 19
St Leonards NSW 1590

Eastern Creek Waste Project (MP06_0139 formally identified as MP06_0239)
(Genesis Landfill and Recycling Centre)
Consultant Endorsement - Independent Environmental Audit

Dear Mr Peart,

I refer to your correspondence seeking endorsement of an auditor to undertake the Independent Environmental Audit (IEA) required under Schedule 5, Condition 7 of the Minister's Project Approval for the above project.

The Department has reviewed the details of the nominated audit team, comprising:

- Mr Jolyon Peart, Cardno Pty Ltd;
- Mr Steven Drysdale, Cardno Pty Ltd;
- Mr Kester Boardman, Cardno Pty Ltd; and
- Mr Michael Assal, The Odour Unit Pty Ltd.

The Department is satisfied that the audit team is sufficiently qualified and experienced to conduct the audit and hereby endorses the team in accordance with Schedule 5, Condition 7 of the Project Approval. This endorsement is conditional upon your independence from the project.

In preparing the IEA, you must ensure the audit:

- is conducted in accordance with AS/NZS ISO 19011 Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing;
- includes a compliance table indicating the compliance status of each condition of approval (and any other statutory instruments required to be audited);
- avoids terms such as "partial compliance": an audit is to make findings of either "compliance" or "non-compliance";
- includes recommended actions in response to non-compliances; and
- identifies opportunities for improved environmental management and performance.

Finally, the Department recommends that you:

- review the IEA report to ensure it complies with the relevant conditions of approval, prior to submitting the report to the Secretary; and
- submit an action plan detailing your response to the recommendations and timeframes outlined in the audit report to implement any adopted recommendations.

Should you have any enquiries, please contact Jane Flanagan, Senior Planner, Industry Assessments, on the above details.

Yours sincerely,

C Ritchie 28/5/15

Chris Ritchie
Manager
Industry Assessments
as delegate of the Secretary

Genesis Landfill and Recycling Centre

APPENDIX D

ODOUR SURVEY

Cardno
Shaping the Future

Genesis Zero Waste Facility
Field Ambient Odour Assessment and Review Study

Prepared for Cardno Limited

Eastern Creek/Minchinbury, NSW

Final Report

August 2015

THE ODOUR UNIT PTY LTD

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Project Number: **N2050L**

Report Revision		
Report Version	**Date**	**Description**
Draft Report	14.07.2015	Draft report issued for review
Final Report	17.08.2015	Final report issued
Report Preparation		
Report Prepared By: M.Assal		**Approved By:** T. Schulz
Report Title: Cardno Limited: Genesis Zero Waste Facility – Field Ambient Odour Assessment Study and Review Study		

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FAOA MAP PLOTS

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APPENDICES

1 INTRODUCTION

In May 2015, The Odour Unit Pty Ltd (TOU) was engaged by Cardno Limited (Cardno) to undertake a Field Ambient Odour Assessment Study (the Assessment) of the Genesis Zero Waste Facility located at Eastern Creek, NSW (the Facility). It is understood that the Assessment will form part of the requirement in the Independent Environmental Audit managed and conducted by Cardno of the landfill and waste processing facilities at the Facility.

The following report summarises the methodology and results from the Assessment conducted by TOU. The Assessment findings are limited to the prevailing conditions found on the day of the audit visit. Therefore, the findings may not necessarily represent other potential operating conditions that could prevail, such as plant upset conditions and high rainfall periods. The intention of the Assessment is to provide adequate information as feed input for the Independent Environment Audit. The Assessment is not intended to be an odour audit in its own right. The findings in this report should be read with this in mind.

1.1 SCOPE OF WORKS

The scope of works for the Assessment was prescribed by Cardno and based on satisfying the audit conditions prescribed in the Facility's Environment Protection Licence (EPL), Project Consent and odour assessment and management plans. The approach taken by Cardno to satisfy the odour related audit conditions is as follows:

a) The undertaking of field-based odour assessment on the day of the audit visit;

b) Review the existing odour assessment reports relevant to the landfill and waste process operations at the Facility; and

c) Assess the adequacy of the existing odour management plan with respect to current industry guidelines or good practice.

TOU undertook the above approach for the Assessment.

1.2 SITE VISITS

1.2.1 Reconnaissance visit

A reconnaissance visit was carried out by TOU's Managing Director and a TOU Senior Engineer & Consultant on 2 June 2015. The objective of this visit was to receive a formal project briefing from Cardno and the Facility on TOU's role and responsibilities during the audit and be given a tour of the Facility's landfill and waste processing operations. The reconnaissance visit was followed by a final visit by TOU on 10 June 2015, during which the main undertakings of the Independent Environmental Audit were conducted by Cardno in the form of an on-site audit visit (see **Section 1.2.2**).

1.2.2 Assessment Visit

The audit visit was undertaken by a TOU Senior Engineer & Consultant supported by an experienced TOU Field Technician on 10 June 2015. TOU's scope during the audit visit consisted of the following:

- The undertaking of a Field Ambient Odour Assessment Survey downwind of the Facility; and
- A review of the landfill and waste processing operations conducted at the Facility. The review consisted of a site walk-around by a staff member from the Facility. The objective of the review was to understand the basic operations at each key area, identify potential odour emission sources and gauge the character/quality of odour emissions from each key area. This enabled the TOU assessors to be familiar with the character of each odour that could be emitted from the Facility and develop a suitable odour descriptor inventory for each key area.

2 THE FACILITY OPERATIONS OVERVIEW

The Facility is located at Eastern Creek in the central western suburbs of Sydney, NSW. Currently, it is licenced to operate as a non-putrescible landfill; material processing centre and waste storage facility. The Facility is also licensed to carry out green waste composting, however, it is understood that this is not being currently undertaken as of this report date for commercial and operational reasons. The type and scale of waste that the Facility is licenced to receive is defined in Environment Protection License (EPL) No. 20121 issued by the New South Wales Environment Protection Authority (EPA) dated 5 June 2014.

2.1 KEY PROCESS AREAS

A simplified site layout highlighting the key areas at the Facility (as found on 10 June 2015) is shown in **Figure 2.1**.

Figure 2.1 – Simplified site layout as found on 10 June 2015

The following sections are intended to provide a brief overview of each key process area shown in **Figure 2.1** as found on 10 June 2015.

2.2 NON-PUTRESCIBLE LANDFILL OPERATIONS

The non-putrescible landfill currently resides inside a large void area which was previously used as a quarry. The non-putrescible landfill currently receives waste product generated from the Material Processing Centre (MPC) which is conveyed to the bottom of the void active tipping face area by a long vertically steep chute system. The waste conveyed through the chute system primarily consists of material that cannot be recycled or recovered in the MPC. **Photo 2.1** shows the non-putrescible landfill area and chute system as present on 10 June 2015.

Photo 2.1 – Non-putrescible landfill area as present on 10 June 2015

2.3 TIMBER YARD AREA

The Timber Yard Area (TYA) consists primarily of the dry-woody material of different size fractions that is generated during sorting and separation processes conducted within the MPC. The sorted and separated material is stockpiled in the TYA until it is sold and transported by trucks off-site. An example of stockpiled material in the TYA as present on 10 June 2015 is shown in **Photo 2.2.**

Photo 2.2 – A section of material stockpiled in the TYA as present on 10 June 2015

2.4 CONSTRUCTION MATERIAL PROCESSING AREA

The construction material processing area stores sorted construction waste that is segregated/crushed to different size fractions. The final product is used as recyclable building material. An example of stockpiled material in the TYA as present on 10 June 2015 is shown in **Photo 2.3.**

Photo 2.3 – An area section of the construction material processing area as present on 10 June 2015

2.5 LEACHATE TREATMENT PLANT

The leachate treatment plant (LTP) exists on the south-eastern corner outside of the quarry Void perimeter. All leachate from the landfill and waste processing operations is directed to this LTP, treated and discharged. The LTP operates in a sequencing batch reactor (SBR) treatment configuration. In the event of excess leachate flow, provisions have been made to direct this to the Leachate Contingency Dam for progressive treatment by the LTP.

3 FAOA SURVEY METHODOLOGY

3.1 PREAMBLE

At present, no Australian Standard exists for FAOA surveys. Consequently, TOU utilises a method for assessing the ground level impacts of odour emissions using a modified version of the German Standard VDI 3940 (1993) – '*Determination of Odorants in Ambient Air by Field Inspections'*. This standard prescribes the methods by which field technicians (or assessors) determine, define and document observed ground level odours and the manner in which the determination of these odours is defined in relation to odour character, frequency of odours observed and the odour intensity of those individual observations as a quantitative scale of measure.

FAOA surveys are considered a valuable odour impact assessment tool as previous experience with ambient odour sampling and subsequent olfactometry testing suggests that accurate and useful ambient odour concentration data is difficult to obtain. Therefore, TOU has adopted a more practical approach based on the field measurement of odour intensity. With this method, calibrated and experienced odour assessor/s traverse the general area and downwind surrounds of odour sources in a strategically mapped pattern, assessing the presence, character and intensity of any odours encountered and recording these observations along with wind speed and direction (when applicable). For the FAOA surveys conducted at the Facility, all accessible upwind and downwind areas on 10 June 2015 were assessed. The assessed areas were based on the wind conditions prevailing at the time of the FAOA Survey.

Figure 3.1 presents the map template for the assessment area and highlights the location of the Facility relative to the measurement location points (see **Section 3.1.1** for details).

Figure 3.1 – FAOA Survey Template for the Assessment

3.1.1 FAOA Survey Measurements Methodology

The techniques employed in the surveys were able to quantify and / or qualify the following:

- Odour intensity:
- Odour character;
- Frequency;
- Extent of odour plume; and
- The likely source of odours detected near and far-field from the Facility

For the surveys undertaken at the Facility, each TOU assessor spent 10 minutes at each Measurement Location Point (MLP) in order to gauge the effects of any odour impact. Each measurement cycle comprised of 60 individual 'grab' assessments of odour, one every 10 seconds for a single measurement cycle of 10 minutes. When plotted each grab measurement resulted in a single data point.

Overall, each survey utilised two assessors, with each assessor undertaking 14 single measurement sets over the assessment area at different MLPs over the duration of the two surveys. The derived results of the survey were then illustrated visually on odour impact maps, which are based on the field logsheets for the survey (see **Appendix A**).

At each MLP, wind velocity and direction was checked using a Vane Anemometer. In the event of a positive detection of odour at a MLP, the TOU assessor attempted to evaluate the odour intensity, odour character and likely source (whenever possible). In this way, the FAOA method enables for the determination and extent of the impact of odour around the area of interest, rank their intensity and likely source.

3.1.2 Odour Intensity Categories

The ranking scale for the observed off-site odours detected beyond the facility boundary were quantified according to the *German Standard VDI 3940 'Determination*

of Odorants in Ambient Air by Field Inspections'. The standard's ranking system is based on the following 7-point intensity scale as shown in **Table 3.1.**

Table 3.1 - VDI 3882 (Part 1) Odour Intensity Categories

Odour Strength	Intensity Rank (code)	TOU Interpretation (meaning)
Not detectable	0	No odour detected
Very Weak	1	Odour recognised and where possible assigned to the odour source
Weak	2	Odour is weak but not yet distinct
Distinct	3	Odour is clearly distinct
Strong	4	Strong odour detectable
Very Strong	5	Very strong odour detectable
Extremely Strong	6	Extremely strong odour detectable

Locations assessed that are assigned an odour intensity score of '0' (not detectable) were still be recorded in order to outline the presence and extent of the odour present at the assessment location. The 'distinct' level is that at which the odour character (e.g. landfill gas, garbage) is clearly definable.

3.1.3 Odour intensity and frequency criterion.

Although outside the scope of work for this project, and referring to the Odour Intensity Categories listed and described in **Table 3.1** above, a particular odour intensity level can often be linked to a possible odour impact from the facilities. This criterion, whether it is Category 2 (Weak) or Category 3 (Distinct), will be dependent upon the sensitivity of the receptor areas, the nature / offensiveness of the odours present and the frequency of exposure. Odour Intensity Category 1 (very weak) would rarely, if ever, correspond to adverse odour impacts.

As previously mentioned in **Section 3.1.1**, the FAOA surveys conducted in the Assessment resulted in the generation of 60 sniffs per measurement cycle per MLP. From this, the data was benchmarked against a suitable frequency impact criterion of 10% i.e. a positive detection of an odour is measured for more than or equal to 10% of

time (equivalent to 10 sniffs) during the measurement cycle at an odour intensity of 1 or greater. This criterion was selected based on previous FAOA studies conducted by TOU and considered to be the event in which adverse odour impact is likely. An example where this criterion was extensively used is the *New South Wales Western Sydney Regional Odour Assessment Project* conducted by TOU in 2012 & 2013 for the NSW EPA.

3.1.4 Surveys Meteorological Conditions

Ideally, FAOA surveys should be carried out over a range of meteorological conditions, from near-calm to moderate to strong wind speeds, and under differing wind directions. The result of each FAOA survey would then determine the impact range within that assessment area for that survey, and the overall findings representing a broader picture of possible adverse odour impacts.

Unfortunately, the relatively short duration of the Assessment coincided with a narrow range of wind speeds, although there was a reasonable range of wind directions available for assessment. The findings of this project are therefore restricted to the wind and weather conditions prevailing at the time of the Assessment, and the nature and condition of the various processes and activities carried out at each of the key areas at the Facility.

The general prevailing local wind conditions at the time of conducting the FAOA surveys were calm (< 0.5 m/s) to light (< 1 m/s) wind speeds, cloudy skies, and wind direction varied however was blowing predominately from the westerly and easterly cardinal directions. Previous rainfall had been encountered prior to the undertaking of the FAOA survey.

3.1.5 FAOA Key Odour Descriptors

The odour sources at the Facility have their origins from the processes occurring at each key area. Based on TOU's experience, the reconnaissance visit and site tour during the audit visit, key odour descriptors were allocated, and subsequently standardised to represent the quality of odours detected within the assessed area as shown in **Figure 3.2**. The odour descriptors used in the surveys enabled for the characterisation of the detected odour/s and determination of likely source, by

strategically undertaking the surveys upwind, downwind and closer to the Facility boundary.

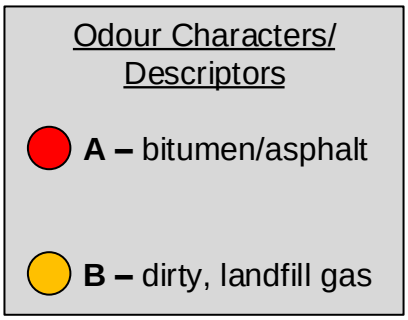


Figure 3.2 – Key odour characters/descriptors used for the FAOA assessment

The definition for each odour character/descriptor used in the FAOA surveys are as follows:

1. **Bitumen/asphalt:** odour likely to be generated from Fulton Hogan process operations that occur adjacent to the Facility; and
2. **Dirty, landfill gas:** odour likely to be generated from MPC non-putrescible landfill area and operations.

Based on TOU's on-site tour visit on 10 June 2015, there is a potential for other key odour descriptors to be included in the FAOA surveys however, for similar reasons outlined in **Section 3.1.4**, it was not possible for alternate conditions to be assessed given these constraints in the Assessment.

3.1.6 Recording of Meteorological Conditions

Local meteorological conditions prevailing over the duration of the FAOA surveys were recorded using a Kestrel 4500 Pocket Weather Tracker Anemometer (see **Photo 3.1** for an illustrated setup). At each MLP assessed, the assessors would setup the anemometer apparatus enabling for real-time measurement of local temperature, wind speed and direction at a MLP over each 10-min measurement cycle. This was undertaken during every survey at each MLP.

Photo 3.1 – Illustrated setup of the Kestrel Anemometer apparatus in operation (***Source:*** *The Odour Unit Pty Ltd*)

4 REVIEW OF RELEVANT DOCUMENTATION

As part of the odour assessment study, TOU was engaged to undertake a concise peer-review of relevant documentation in relation to odour. The documents that were made available to TOU for this review are as follows:

- Air Quality – *Odour and Dust: Light Horse Business Centre Development Application* (April 2008); and
- Environmental Management Strategy: *Air Quality Odour and Greenhouse Gas Management Plan* (June 2011).

This section provides a concise review of these two documents, and evaluates whether or not this is consistent with best industry practice and whether the current management controls are actively in place to attenuate odour emissions from the Facility.

4.1 ODOUR AND DUST ASSESSMENT: DEVELOPMENT APPLICATION (APRIL 2008)

TOU understands that an odour (and dust) assessment was undertaken as part of the Development Application (DA) for the Facility in 2008, and is currently the only odour assessment carried out since commencement of operations. It was prepared for Environment Resources Management Australia Pty Ltd (ERMA) on behalf of Light Horse Business Centre.

4.1.1 Approach and Assessment Methodology

The 2008 odour assessment appears to have been undertaken in accordance with the relevant technical guidelines set by the New South Wales Environment Protection Authority (NSW EPA) at the time that the assessment was being undertaken.

The dispersion model used was CALPUFF. This is considered appropriate given the complex topography and meteorological conditions prevailing at the Facility location. In addition, the selection of a ground level odour criterion (glc) of 2 odour units (ou) for the modelling is conservative and considered appropriate given the close proximity of the existing, densely populated, urban residential area, to the north and west of the Facility.

Without being provided the raw modelling files, there is no way of checking the model itself. This could be carried out in the event of the undertaking of an odour verification assessment, where the estimated odour emissions can be used to verify the predicted modelling results, if ever required (see **Section 4.1.2** for further details). Overall, however, TOU is satisfied with the approach and assessment methodology used in the 2008 odour assessment.

4.1.2 Odour emissions data

The odour emissions data used in the 2008 odour assessment appear to be based on the Facility's previous operations at its Alexandria Facility, where its non-putrescible landfill operations had occurred. An assumption is made in this odour assessment that given the Alexandria Facility at the time accepted a similar waste stream, the odour emissions for the active tipping face and capped areas are representative of what the Facility's emissions would be once approved and in operation. This approach is considered appropriate given the absence of data that appeared to be available at the time. In addition, the higher results from the measurement data for these areas have been used for the modelling, and this is considered appropriate and conservative given the close proximity of the urbans area to the north and west of the Facility.

For the active tipping face and capped areas, the 2008 odour assessment appears to apply a correction factor of 1% (derived from 32 tonnes of organic waste in 5,282 tonnes of total waste received in 2006) to the emissions data for these sources to account for the lower organic or biodegradable material expected to be received at the Facility. Whilst at first glance this could appear reasonable, TOU considers that this correction factor is not necessarily applicable for the following reasons:

- Waste streams are very well known to vary in mixture composition (there are many factors for this including, but not limited to, social dynamics in different municipal areas, consumption trends at the time, and production technologies), and it is difficult therefore to assume that such compositions would prevail throughout the life of the Facility's landfill operations; and

- There is no rigorous evidence in the 2008 odour assessment to suggest that lower volumes of organic/biodegradable waste in inorganic waste will result in a

lower specific odour emission rate (ou.m^3/m^2/s) from the covered tip face and capped areas. TOU would consider that this would reduce the mass emission rate of landfill gas/odour and not concentration of the potential emissions. Therefore, it would be better to correct emission rates based on potential fugitive gas emission rate from the landfill rather than on a waste tonnage basis.

In addition, the odour emissions for the leachate/dam trench appear to be based on measurements from a greenwaste processing facility, and not for landfill gas operations, and also assume aerobic conditions. No background details are given on the specific wastewater treatment system that the data was derived from and nor is its applicability to the Facility's current operations.

No greenwaste processing is carried out at the Facility and therefore the emissions in this 2008 odour assessment for greenwaste windrows is not applicable. No other context behind the usage of this odour emission has been provided.

Based on the above review analysis, TOU is of the opinion there is a requirement to undertake an odour verification assessment consisting of odour sampling and testing to characterise the current odour emissions of the Facility, for the purposes of:

a) Verifying the odour emissions data used in the Environmental Assessment (EA) for the project approval; and

b) Informing the need for, and if required, the scope of a long term odour monitoring program for the Facility.

4.2 AIR QUALITY ODOUR AND GREENHOUSE GAS MANAGEMENT PLAN (JUNE 2011)

The air quality odour (and greenhouse gas management plan) was developed by Light House Business and appears to be based on two previous documents, as follows:

- 22 December 2009 Air Quality Management Plan by PAE Holmes; and
- 1 July 2010 Noise and Air Quality Monitoring Report.

TOU did not have access to these documents at the time of writing this assessment report.

The Facility's odour management plan (OMP) is contained within the air quality odour and greenhouse gas management plan and is titled *Odour Management*. It is considered by TOU that the OMP is very concise and limited in detailing process information and specific operational practices used at each key area at the Facility to attenuate odour emissions. It also appears to be solely focused on the landfill gas operations. It is TOU's experience at other waste processing facilities across Australia that the OMP should be a site-specific, comprehensive document that:

- Documents the regulations, operating practice and procedures undertaken at the Facility;
- Contains odour monitoring programs currently in use or planned. Landfill gas monitoring is noted in the current OMP however no recent monitoring data has been sighted or provided to TOU. A landfill gas monitoring strategy and site-specific landfill gas data would assist in evaluating the level of fugitive emissions from the landfill operations. TOU is uncertain whether or not this monitoring strategy is being undertaken at the Facility;
- Is a 'live' document which is updated regularly by the Facility's Environment Officer/Management Team to ensure it is constantly reflecting the operating conditions prevailing at any given time; and
- The OMP should document an odour complaints procedure specifying how complaints are handled and recorded. It should be orientated at assisting the Facility with useful feedback from the community, such as corresponding an odour complaint to process conditions prevailing at the time of the incident. This would provide valuable feedback to the Facility in regards to actively managing on-site odour emissions.

TOU's opinion is that the OMP in its current status requires considerable update and expansion to reflect current operating conditions, highlight the odour risks and controls at the Facility, and best industry practice. This advice is consistent with the project approval conditions (Condition B of the *Air Quality, Odour and Greenhouse Gas Management Plan*) which stipulates that:

b) Describe in detail the measures that would implemented on site to control the odour and air quality impacts of the project, and to ensure that these controls remain effective over time.

Notwithstanding this, the information provided in the current air quality plan, in principal, is considered to be valid operational practices aimed at attenuating odour emissions. In addition, some of the air quality and greenhouse gas control measures mentioned in the air quality plan would be applicable to odour management (such as the landfill gas monitoring/management strategies), however, this link is not immediately obvious in the current state of the OMP.

5 FAOA SURVEY RESULTS

5.1 INTERPRETATION OF SURVEY FINDINGS

Each map plot result shown consists of several features. These are generally depicted on a pie chart and wind vane indicator on each map plot. The features include:

- **MLP**: these are strategic points on the map were designed to enable assessors to pursue upwind and downwind effects from the Facility;
- **Location wind conditions**: the local wind direction and speed at each MLP has been indicated by a yellow arrow. In the event a wind direction has not been indicated, the conditions at the time were calm (i.e. < 1 m/s) and wind direction was unable to be accurately determined. The recorded wind conditions at each MLP may have varied at the time of the assessment from the prevailing wind conditions that existed in the general Sydney precinct recorded by local meteorological stations. Given the complex meteorological dynamics that can occur arising (such as local terrain, topography, katabatic channelling and effects from natural and built environments) affecting wind direction and speed, the local wind conditions experienced at some MLP varied from the prevailing wind condition; and
- **Odour descriptors:** at each MLP where a measurement cycle was undertaken, key parameters were recorded in the event an odour was detected (methodology for this has been previously described in **Section 3.1.5**). The key descriptors shown on the maps includes the intensity of odour (how strong the smell was) based on the VDI 3882 German Odour Intensity Scale. In addition, the odour character was also recorded based on an odour character inventory developed by TOU to describe the range of odours encountered throughout the course of the surveys.

5.1.1 FAOA Map Plot Result

Section 5.2 contains the findings of each of the FAOA surveys. The logsheets for each FAOA survey, showing the raw field data, are appended as **Appendix A.**

5.2 FAOA SURVEY RESULTS

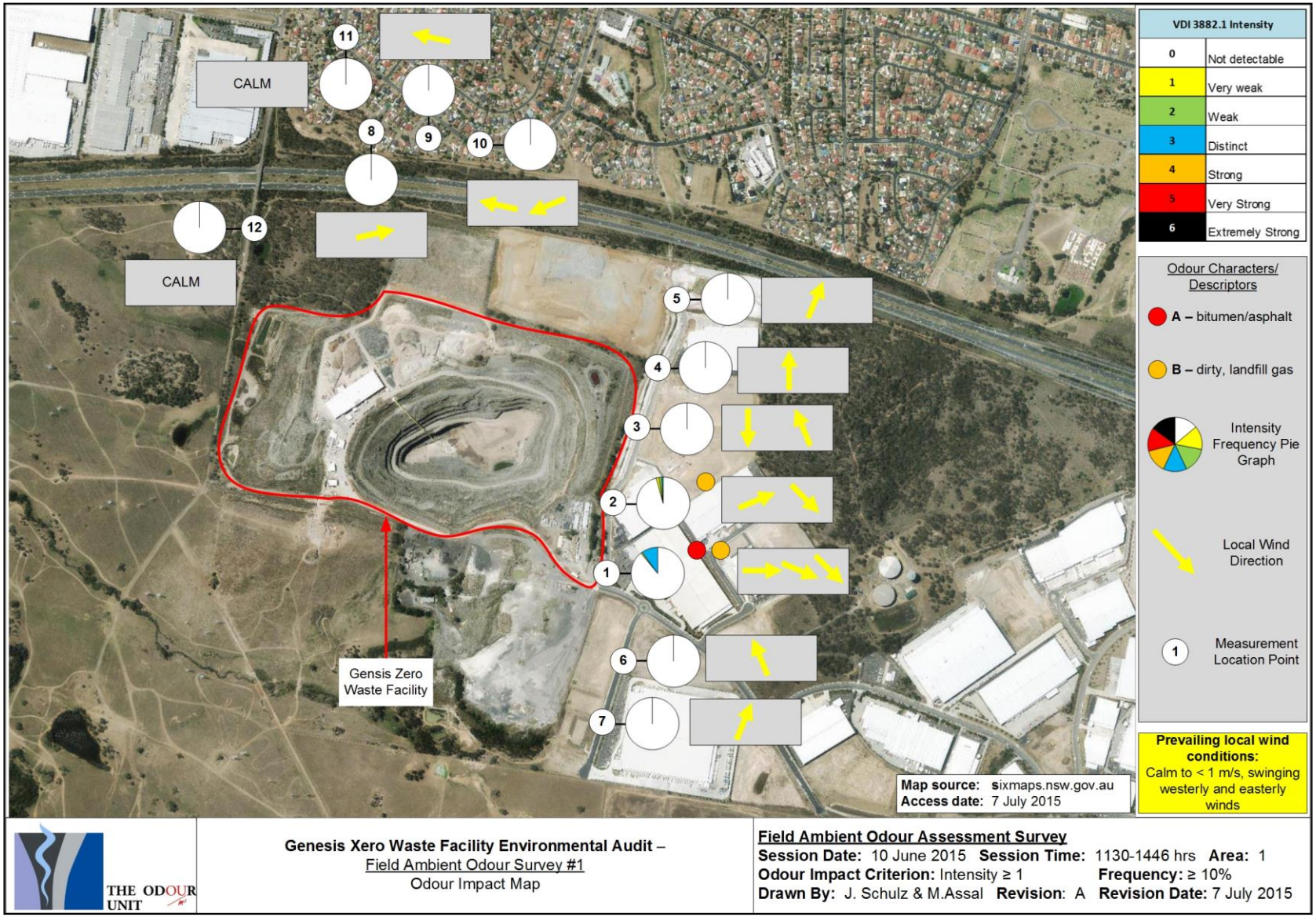
The following comments on results should be read in conjunction with their corresponding FAOA Map Plots. The likely source/s mentioned in these results is based on the odour character/s detected and position of the odour source/the Facility relative to the wind direction i.e. whether the odour source/the Facility was upwind or downwind of a positive detection event.

5.2.1 FAOA Survey #1: 1130 hrs – 1446 hrs

FAOA Survey #1 was carried out on 10 June 2014 between 1130 hrs to 1446 hrs. The wind conditions at the time of this survey assessment were calm (< 0.5 m/s) to light (< 1 m/s) winds, swinging between westerly and easterly cardinal directions. Local wind direction varied during the survey.

The results from this survey is as follows:

- At MLP 1 i.e. close to the site boundary along Kangaroo Avenue odour was intermittently detected at an intensity between Very Weak to Distinct (odour intensity values of 1 to 3 respectively), with distinct prevailing for the bulk of measurement period;
- The odour character/descriptor detected at MLP 1 varied across the measurement cycle. The initial odour character detected was 'bitumen/asphalt' followed by a period of no odour. This suggested that the likely source of this odour was the Fulton Hogan operations that operate in the southern eastern area of the Facility. The next positive detection during the measurement cycle was a 'dirty/landfill gas' odour suggesting that the non-putrescible landfill area was the likely source;
- The dirty/landfill gas odour was further detected at MLP albeit at a much lesser duration and odour intensity of Very Weak to Weak; and
- No other odour was detectable from MLP 3 to MLP 12 at the time of the survey assessment including further downwind areas of the Facility and nearby Minchinbury urban areas that exist to the north of the Facility.



FAOA Survey Map Plot 5.1 – FAOA Survey No. 1: 10 June 2015 between 1130 hrs and 1446 hrs

5.2.2 FAOA Survey #2: 1454 hrs -1517 hrs

FAOA Survey #2 was carried out on 10 June 2014 between 1454 hrs to 1517 hrs. The wind conditions at the time of this survey assessment were light (1-2 m/s) winds, tending predominately from the south. Local wind direction varied during the survey.

The objective of this survey was to revisit MLPs 1 & 2 to evaluate if another positive odour detection event could be observed at these locations.

The results from this survey is as follows:

- No other odour was detectable at the time of this survey assessment. This is likely due to a combination of wind and/or operating conditions prevailing at the time of the assessment.

FAOA Survey Map Plot 5.2 - FAOA Survey No. 2: 10 June 2015 between 1454 hrs and 1517 hrs

6 ASSESSMENT FINDINGS/RECOMMENDATIONS

6.1 REVIEW FINDINGS/RECOMMENDATIONS

The findings from the review indicate that the Facility requires additional information to that currently available to better reflect current operations and industry best practice. Based on the review findings in the Assessment, the following is recommended:

- An update to the current OMP. This update should document in more details the regulations, operating practices and procedures, odour monitoring programs currently in use and/or planned, and odour risks and controls. Once this is implemented, the OMP should be used as a 'live' document, and updated regularly; and

- In conjunction with the next bi-annual environmental audit, the undertaking of an odour verification assessment consisting of odour sampling and testing to characterise the current odour emissions of the Facility, for the purposes of:

    a) Verifying the odour emissions data used in the Environmental Assessment (EA) for the project approval; and

    b) Informing the need for, and if required, the scope of a long term odour monitoring program for the Facility.

6.2 FAOA SURVEY FINDINGS

The overall FAOA Survey findings indicate that minimal adverse odour impact beyond the Facility boundary was found at the time of the Assessment. Notwithstanding this result, there were instances during the FAOA survey assessment period where odour from the Facility was detectable within the immediate vicinity of the site boundary i.e. along Kangaroo Avenue, however, this odour was not detectable further downwind from the Facility at the time. The odour characters/descriptors detected included a dirty/landfill gas odour and a bitumen/asphalt odour. The former odour character/descriptor suggests that the likely source was from the landfill gas operations at the Facility at the time of the assessment. The latter odour character/descriptor suggests the likely source at the time was the asphalt processing plant, which is understood to be not related to the Facility operations. Otherwise, no

other odour was detectable during the Assessment that could be related back to other key operations at the Facility.

6.3 ASSESSMENT STUDY LIMITATIONS

Ideally, FAOA surveys should be carried out over a range of meteorological conditions, from near-calm to moderate to strong wind speeds, and under differing wind directions. The results of each FAOA survey would then determine the impact range within that assessment area for that survey, and the overall findings representing a broader picture of possible adverse odour impacts.

Unfortunately, the relatively short duration of the Assessment coincided with a narrow range of wind speeds, although there was a moderate range of wind directions available for assessment however not favourable at times. The findings of this project are therefore restricted to the wind and weather conditions prevailing at the time of the Assessment, and the nature and condition of the various processes and activities carried out at each of the key areas at the Facility. The findings should be read with this in mind.

7 REFERENCES

- Six Maps, Figure 2.1 – Simplified site layout, **URL**: https://maps.six.nsw.gov.au/ [Access date: 10 June 2015]
- Six Maps, FAOA Survey Map Plot 5.1 – FAOA Survey No. 1: 10 June 2015 between 1130 hrs and 1446 hrs, **URL**: https://maps.six.nsw.gov.au/ [Access date: 10 June 2015]
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REPORT SIGNATURE PAGE

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Genesis Zero Waste Facility

Field Ambient Odour Assessment and Review Study

Prepared for Cardno Limited

Eastern Creek/Minchinbury, NSW

Appendix

August 2015

APPENDIX A:

FAOA SURVEY FIELD LOGSHEETS

FAOA - Session Summary (Odour Intensity)

THE ODOUR UNIT

Date: 10/06/2015 **Start Time:** 1130 hrs **End Time:** 1249 hrs

Assessment Area: 1 **Intensity ≥** 1 **Frequency ≥** 10%

Location	1			2			3			4			5			6		
Intensity	1	2	%	1	2	%	1	2	%	1	2	%	1	2	%	1	2	%
0	54	53	89%	58	57	96%	60	60	100%	60	60	100%	60	60	100%	60	60	100%
1	0	1	1%	1	1	2%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
2	0	0	0%	1	1	2%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
3	6	6	10%	0	1	1%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
4	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
5	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
6	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
≥ 1's	6	7	11%	2	3	4%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Freq Exceeded?	YES			NO			NO			NO			NO			NO		
≥ 2's	6	6	10%	1	2	3%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Freq Exceeded?	YES			NO			NO			NO			NO			NO		

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Michael Assal **Member ID:** 1 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1130 hrs **End Time:** 1249 hrs

Measurement Point: **1**
Wind Speed and Direction: < 1 m/s WNW
Start: 1130 hrs End: 1140 hrs

min-1	0	3	3	3	3	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	3	3	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

Local wind direction swinging between W and NW

Measurement Point: **2**
Wind Speed and Direction: < 1 m/s WNW
Start: 1143 hrs End: 1153 hrs

min-1	0	1	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	2

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

Local wind direction swinging between WNW and SSW

Wind speed intermittently between 1-2 m/s

Measurement Point: **3**
Wind Speed and Direction: < 1 m/s N
Start: 1157 hrs End: 1207 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

Local wind direction swinging between N and SSE

Measurement Point: **4**
Wind Speed and Direction: <1 m/s S
Start: 1211 hrs End: 1221 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

None

Measurement Point: **5**
Wind Speed and Direction: < 1 m/s SSW
Start: 1224 hrs End: 1234 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

None

Measurement Point: **6**
Wind Speed and Direction: < 1 m/s SSE
Start: 1239 hrs End: 1249 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	--	--	--	
--	--	--	--	--	

Field comments:

None

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Alex Schulz **Member ID:** 2 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1130 hrs **End Time:** 1249 hrs

Measurement Point: **1**
Wind Speed and Direction: < 1 m/s WNW
Start: 1130 hrs End: 1140 hrs

min-1	3	3	3	3	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	3	3	1	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
Local wind direction swinging between W and NW

Measurement Point: **2**
Wind Speed and Direction: < 1 m/s WNW
Start: 1143 hrs End: 1153 hrs

min-1	3	1	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	2

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
Local wind direction swinging between WNW and SSW
Wind speed intermittently between 1-2 m/s

Measurement Point: **3**
Wind Speed and Direction: < 1 m/s N
Start: 1157 hrs End: 1207 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
Local wind direction swinging between N and SSE

Measurement Point: **4**
Wind Speed and Direction: <1 m/s S
Start: 1211 hrs End: 1221 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
None

Measurement Point: **5**
Wind Speed and Direction: < 1 m/s SSW
Start: 1224 hrs End: 1234 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
None

Measurement Point: **6**
Wind Speed and Direction: < 1 m/s SSE
Start: 1239 hrs End: 1249 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
A	B	C	--	--	
--	--	--	--	--	

Field comments:
None

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

FAOA - Session Summary (Odour Intensity)

Date: 10/06/2015 **Start Time:** 1253 hrs **End Time:** 1446 hrs

Assessment Area: 1 **Intensity ≥** 1 **Frequency ≥** 10%

Location	7			8			9			10			11			12		
Intensity	1	2	%	1	2	%	1	2	%	1	2	%	1	2	%	1	2	%
0	60	60	100%	60	60	100%	60	60	100%	60	60	100%	60	60	100%	60	60	100%
1	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
2	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
3	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
4	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
5	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
6	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
≥ 1's	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Freq Exceeded?	NO			NO			NO			NO			NO			NO		
≥ 2's	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Freq Exceeded?	NO			NO			NO			NO			NO			NO		

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Michael Assal **Member ID:** 1 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1253 hrs **End Time:** 1446 hrs

Measurement Point: **7**
Wind Speed and Direction: < 1 m/s SSW
Start: 1253 hrs End: 1303 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

None

Measurement Point: **8**
Wind Speed and Direction: <1 m/s WSW
Start: 1340 hrs End: 1350 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

Tod Pl, Minchinbury. Winds intermittently calm during measurment period. Local ambient temperature 14.6 °C

Measurement Point: **9**
Wind Speed and Direction: < 1 m/s ESE
Start: 1354 hrs End: 1404 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

Rutherglen Pl, Minchinbury

Measurement Point: **10**
Wind Speed and Direction: <1 m/s ESE
Start: 1407 hrs End: 1417 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

Ann Minchin Way, Minchinbury. Wind direction swinging between ESE and ENE

Measurement Point: **11**
Wind Speed and Direction: Calm
Start: 1421 hrs End: 1431 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

McFarlane Dr, Minchinbury. Slight ESE wind gust (< 1 m/s) intermittently present measurement period

Measurement Point: **12**
Wind Speed and Direction: Calm
Start: 1436 hrs End: 1446 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:

Archbold Rd, Minchinbury

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Alex Schulz **Member ID:** 2 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1253 hrs **End Time:** 1446 hrs

Measurement Point: **7**
Wind Speed and Direction: < 1 m/s SSW
Start: 1253 hrs End: 1303 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
None

Measurement Point: **8**
Wind Speed and Direction: <1 m/s WSW
Start: 1340 hrs End: 1350 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
Tod Pl, Minchinbury. Winds intermittently calm during measurment period. Local ambient temperature 14.6 °C

Measurement Point: **9**
Wind Speed and Direction: < 1 m/s ESE
Start: 1354 hrs End: 1404 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
Rutherglen Pl, Minchinbury

Measurement Point: **10**
Wind Speed and Direction: <1 m/s ESE
Start: 1407 hrs End: 1417 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
Ann Minchin Way, Minchinbury. Wind direction swinging between ESE and ENE

Measurement Point: **11**
Wind Speed and Direction: Calm
Start: 1421 hrs End: 1431 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
McFarlane Dr, Minchinbury. Slight ESE wind gust (< 1 m/s) intermittently present measurement period

Measurement Point: **12**
Wind Speed and Direction: Calm
Start: 1436 hrs End: 1446 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0

Descriptor(s):					
	A	B	--	--	--
	--	--	--	--	--

Field comments:
Archbold Rd, Minchinbury

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

FAOA - Session Summary (Odour Intensity)

Date: 10/06/2015 **Start Time:** 1454 hrs **End Time:** 1517 hrs

Assessment Area: 1 **Intensity ≥** 1 **Frequency ≥** 10%

Location	1			2															
Intensity	1	2	%	1	2	%													
0	60	60	100%	60	60	100%													
1	0	0	0%	0	0	0%													
2	0	0	0%	0	0	0%													
3	0	0	0%	0	0	0%													
4	0	0	0%	0	0	0%													
5	0	0	0%	0	0	0%													
6	0	0	0%	0	0	0%													
≥ 1's	0	0	0%	0	0	0%													
Freq Exceeded?	NO			NO															
≥ 2's	0	0	0%	0	0	0%													
Freq Exceeded?	NO			NO															

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Michael Assal **Member ID:** 1 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1454 hrs **End Time:** 1517 hrs

Measurement Point: 1
Wind Speed and Direction 1-2 m/s S
Start: 1454 hrs End: 1504 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

Wind direction swinging between SSE and SSW

Measurement Point: 2
Wind Speed and Direction 1-2 m/s S
Start: 1507 hrs End: 1517 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

Wind direction swinging between SSE and SSW

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

FAOA - Field Data Record Sheet (Odour Intensity & Quality)

THE ODOUR UNIT

Name: Alex Schulz **Member ID:** 2 **Date:** 10/06/2015

Assessment Area: 1 **Start Time:** 1454 hrs **End Time:** 1517 hrs

Measurement Point: 1
Wind Speed and Direction 1-2 m/s S
Start: 1454 hrs End: 1504 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

Wind direction swinging between SSE and SSW

Measurement Point: 2
Wind Speed and Direction 1-2 m/s S
Start: 1507 hrs End: 1517 hrs

min-1	0	0	0	0	0	0
min-2	0	0	0	0	0	0
min-3	0	0	0	0	0	0
min-4	0	0	0	0	0	0
min-5	0	0	0	0	0	0
min-6	0	0	0	0	0	0
min-7	0	0	0	0	0	0
min-8	0	0	0	0	0	0
min-9	0	0	0	0	0	0
min-10	0	0	0	0	0	0
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

Wind direction swinging between SSE and SSW

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Measurement Point:
Wind Speed and Direction
Start: End:

min-1						
min-2						
min-3						
min-4						
min-5						
min-6						
min-7						
min-8						
min-9						
min-10						
Descriptor(s):	A	B	--	--	--	
	--	--	--	--	--	

Field comments:

None

Weather conditions: cloudy, previous rainfall event, no rain during survey time

Key Odour Descriptors:

A = bitumen/asphalt

B = dirty, landfill gas

Genesis Landfill and Recycling Centre

APPENDIX E

MANAGEMENT PLAN REVIEW

Cardno
Shaping the Future

Management Plan Review

Requirement	Assessment	Recommendations
Currency	The revision date is June 2013. The Management Plan is not current.	Revise the Management Plan in accordance with its specified revision schedule.
Adequacy	The Management Plan is generally adequate for its intended purpose.	Update the management plan to better reflect the status of the project (operational phase not construction phase).
AIR QUALITY, ODOUR AND GREENHOUSE GAS MANAGEMENT PLAN		
Currency	The revision date is June 2013. The Management Plan is not current.	Revise the Management Plan in accordance with its specified revision schedule.
Adequacy	The Management Plan is generally adequate for its intended purpose, however opportunities for improvement exist, specifically: With respect to Odour, the Plan appears to be solely focused on landfill gas (and does not consider other potential sources of odour). The Plan does not document the regulations, operating practice and procedures undertaken at the Facility nor document a monitoring approach.	Consider the following during revision of the plan: the plan is at odds with the landscape and vegetation monitoring MP in that it recommends the cultivation of exotic species on the amenity berms whereas the landscape plan requires only native species be planted on the berms. Unless defined within other procedures, include provision for the monitoring of airborne (asbestos) fibres within this plan. The OMP should document an odour complaints procedure specifying how complaints are handled and recorded. It should be orientated at assisting the Facility with useful feedback from the community, such as corresponding an odour complaint to process conditions prevailing at the time of the incident. This would provide valuable feedback to the Facility in regards to actively managing on-site odour emissions.
AMENITY BERMS MANAGEMENT PLAN		
Currency	The plan is dated June 2011. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The Management Plan is generally adequate for its intended purpose, however it is overly focused on the construction and commissioning phases of the project.	Revise the Management Plan, taking into account the following: (a) the new plan should include a realistic erosion, slope stability and vegetation monitoring program, and (b) detail the measures that would be undertaken in responses to erosion, weed proliferation and failed plantings. The plan should consider the relative merits of native vegetation and the leighton green plantings recommended by the Air Quality Management Plan.
ASBESTOS HANDLING PROCEDURE - EASTERN CREEK		
Currency	The plan is not dated. The plan does not specify a revision date.	Engage a suitably qualified Occupational Hygienist to review and revise the procedure. Include a revision schedule on the revised version.
Adequacy	The Management Plan is generally adequate for its intended purpose, however it is noted that the efficacy of the plan is dependent on the competence and diligence of the staff undertaking the inspections.	Revise the Management Plan, taking into account the following: (a) Quality Assurance and process monitoring procedures should be detailed in the procedure, including regular checks on the asbestos identification process. (b) the procedure indicates asbestos waste will be taken off site to a licenced landfill, whereas elsewhere it is noted that asbestos is disposed of through burial in the quarry void. (c) the procedure uses water application and temporal measures to mitigate risk, these should be reviewed by the Occupational Hygienist for adequacy during the review of the plan.
EMERGENCY EVACUATION MANAGEMENT PLAN		
Currency	The plan is dated February 2011. The specified revision date is February 2016. The Management Plan is current.	N/A
Adequacy	Cardno cannot comment on the wider adequacy of this plan. Recommendations provided here are focused on parts of the plan of relevance to the environment.	It is recommended that upon revision of the plan, greater emphasis is placed on bushfire management and the storage and handling of flammable and combustible substances. All major flammable and combustible product stores should be clearly identified on the plan and a clear inspection and maintenance schedule for these facilities should be specified. The bushfire management section of this plan is generic. This should be replaced by a detailed site specific bushfire management plan or sub-plan which includes provisions for the maintenance of asset protection zones.
FENCING AND SECURITY MANAGEMENT PLAN		
Currency	The plan is dated June 2011. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	Cardno cannot comment on the adequacy of this plan.	

GREEN WASTE MANAGEMENT PLAN		
Currency	The plan is dated June 2011. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The Management Plan is generally adequate. The plan appears to be excessively focused on putrescible green waste rather than the relatively inert timber products currently processed. A large proportion of the requirements within the plan are not commensurate to the nature the current operations, as a result ambiguity exists as to whether they are applicable the current operations. Examples of such conditions are listed below.	Revise the procedure, including consideration of those items listed in the preceding column.
	Greenwaste windrows should be temperature tested each morning and turned if required	N/A
	Each windrow of shredded material will be covered end to end with suitable material to minimise the inflow of water and the release of odour to atmosphere.	
	In order to facilitate and expedite the biodegradation process, blown air will be introduced to the base of each windrow of shredded material via perforated HDPE or steel pipes. One pipe will be located per bay/windrow	
	The operator will take steps to reduce odour by ensuring that offensive and odorous wastes are not accepted at the MPC, or if accepted are disposed and covered as quickly as possible.	
	Odour monitoring will be undertaken on a daily basis by the Site Manager and the designated Site Environmental Officer.	
	Stockpiles should not be anaerobic under normal circumstances, but will be tested quarterly at 2 metre intervals along their surfaces for the presence of CH4. <assumed in relation to green waste>	
GROUNDWATER MONITORING PLAN		
Currency	The plan is dated October 2012. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The Management Plan is generally adequate.	It is recommended that upon revision of the plan, the following should be included: (a) Detailed sampling procedures, (b) QA/QC procedures, (c) the adopted assessment criteria, (d) the Data Quality Objectives of the monitoring program, (e) contingencies to be followed in the event risks to human health or the environment are identified, (f) a detailed discussion of the conceptual site model, including identification of receptors and pollutant - receptor pathways, (g) a list of the specific contaminants of potential concern associated with the project and a precise list of the corresponding analytes to be tested.
COMBINED LANDSCAPE AND VEGETATION MANAGEMENT PLAN		
Currency	The Landscape MP plan is dated June 2011. The plan does not specify a revision date. The Vegetation MP is dated October 2009 and a revision date of October 2014 is specified.	Revise the plan(s) and include a revision schedule on the revised version.
Adequacy	The Management Plan is generally adequate for its intended purpose. It is noted that ambiguity exists as to the applicability of some conditions, particularly in relation to daily monitoring.	Any revision of the plan should consider expanding the scope of the plan to include other vegetated parts of the site eg the pit void and berms (in accordance with project consent condition 06_0139-3,54).
NOISE MONITORING PROGRAM		
Currency	The plan is dated June 2011. The plan does not specify a revision date.	Revise the Program and include a revision schedule on the revised version.
Adequacy	The Program is overly focused on the construction and commissioning phases of the project. A Noise Management Plan would be a more useful vehicle for mitigating the noise impacts of the project.	Undertake noise monitoring at 6 monthly intervals for one year. Prepare a Noise Management Plan for the site having consideration for the data obtained during the monitoring, and the level of risk presented by noise emissions from the site.
OIL SPILL CLEAN UP PROCEDURE		
Currency	This procedure is neither dated nor is a revision schedule indicated.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The procedure suffers from significant omissions, including: (a) Incident reporting mechanisms (internal and external), (b) procedures to be followed in the event of a spill on bare ground (soil), including removal of contaminated soils, (c) procedures for the off-site disposal of contaminated materials.	Revise the procedure, including those items listed in the preceding column. It is further recommended that the primacy of risks posed to human safety be reinforced over other risks.
PESTS, VERMIN AND WEEDS MANAGEMENT PLAN		
Currency	The plan is dated June 2011. The plan does not specify a revision date.	Revise the plan and include a revision schedule on the revised version.

Adequacy	The plan contains a number of deficiencies, including: (a) the plan is overly focused on the construction phase of the project, (b) The plan speaks in generalities about pests, and lacks specific monitoring and management/control measures (including schedules) for key pest species.	Revise the procedure, in consideration of those items listed in the preceding column. It is noted that the control of weeds is addressed in the Vegetation Management Plan. For clarity, this should be noted in any future revision of the Pests Vermin and Weeds Management Plan. The plan should be broadened to include feral animals across the site in general (such as foxes and cats).
POLLUTION INCIDENT RESPONSE MANAGEMENT PLAN		
Currency	The plan is dated November 2012. The plan specifies a revision date of November 2013. The plan is not current.	Revise the Program to ensure it is current.
Adequacy	The plan is generally adequate for its intended purpose.	Consider the following during any future revision of the plan: (a) typical or suggested responses to surface water pollution incidents should be detailed to assist staff respond to such incidents promptly, (b) the risk of spills / leaks / releases of chemicals and hydrocarbons to soil should be addressed, including clean up procedures, (c) detail what constitutes 'material environmental harm' including a list of potential pollution situations that could be construed as 'material environmental harm' and therefore regulatory reporting, (d) detail the internal incident reporting process for pollution incidents.

SITE SURFACE WATER MANAGEMENT PLAN		
Currency	The plan is dated November 2008. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The plan is dated (seven years old) and was prepared prior to the construction of the facility / site in question. The plan would therefore benefit from revision to ensure it is applicable to the nature of the site as it is at present. Additionally, the plan is overly focused on the modelling underpinning the design of the stormwater management system, and the design of the system itself. The plan would benefit from inclusion of practical mitigation measures, customized to the existing infrastructure, and described in detail, together with the person responsible and the timing required for each measure.	Revise the procedure, in consideration of those items listed in the preceding column.
SOIL, WATER AND LEACHATE MANAGEMENT PLAN		
Currency	The plan is dated December 2011. The plan does not specify a revision date.	Revise the Procedure and include a revision schedule on the revised version.
Adequacy	The plan is adequate for its intended purpose.	